SEP 14 1922

Watch the Trend of Business—Page 705

THE IRON TRADE REVIEW

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ADAMITE

(PATENTED)

"The Metal of Secret Service"

THE ETERNAL QUESTION—
"Will it perform as well as Adamite?"

Time Will Tell!

—only the "fit" will survive the gruelling tests in service.

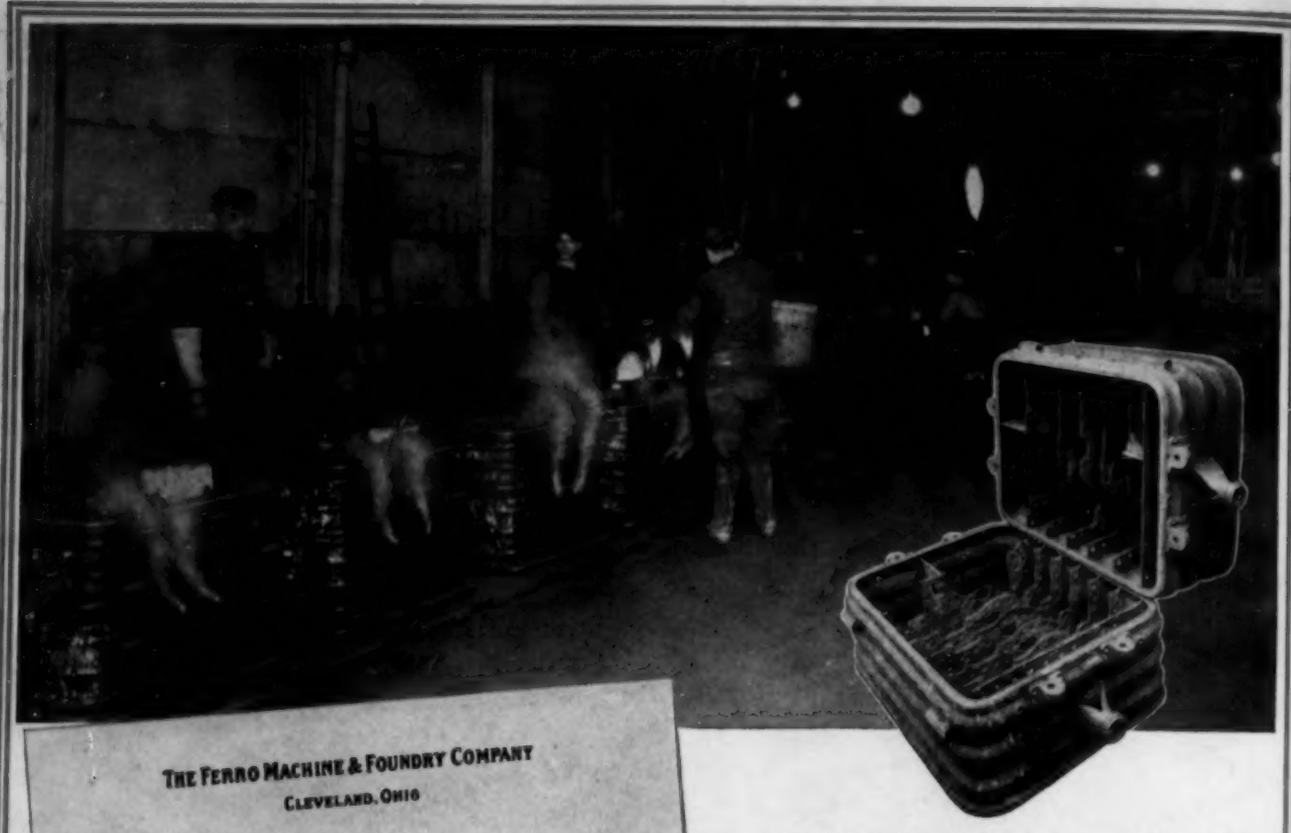
ADAMITE (PATENTED) through a period of years has demonstrated its "fitness". Its quality of performance under all the most difficult mill conditions has won for "Adamite" the respect and good-will of all who want greatest economy and dependable results.

WHAT ARE THE FACTS TODAY?

Increased tonnage and decreased costs result from the use of Adamite.

What is your answer to the question—
"WILL IT PERFORM AS WELL AS ADAMITE?"

Sole Manufacturers: MACKINTOSH-HEMPHILL CO.
UNITED ENGINEERING & FOUNDRY CO.



THE FERRO MACHINE & FOUNDRY COMPANY
CLEVELAND, OHIO

February 2, 1922.

Mr. Sparks,
c/o The Truscon Steel Co.,
Youngstown, Ohio.

My dear Mr. Sparks:-

In reply to your inquiry as to our opinion of Truscon flasks, am glad to say that we are more than pleased with our experience with the flasks made by your company. I deem them far superior to any other type of flask known to me in the market. The flasks are rigid and well made and are considerably lighter than the usual run of cast iron flasks; there being absolutely no breakage and no repairs. Taking it as a whole, for our work I consider them cheaper than the cast iron flask, and cheerfully recommend them to the trade in general.

Yours very truly,
THE FERRO MACHINE & FOUNDRY CO.
J. T. Stoney,
Foundry Manager.

JTS:MO

THIS glimpse of The Ferro Machine & Foundry Company, Cleveland, Ohio, shows a conveyor upon which Hupp Automobile cylinders are being "poured" in Truscon Alloy Steel Flasks. These flasks play an important part in making it possible for a large production to be steadily maintained with an unusually small number of men.

The rib design of Truscon Flasks make them easy to "ram up" and easy to "shake out."

The insert is an actual photograph showing the splendid condition of one of these Truscon rust resisting Alloy Steel Flasks after many months of hard daily use. This is why Mr. J. T. Stoney, the Foundry Manager, says in his letter "I deem them [Truscon Flasks] far superior to any other type of flask known to me in the market."

Truscon Steel Co.
Youngstown Ohio

TRUSCON ALLOY FLASKS STEEL

FOUNDRY PRODUCTS
TRUSCON STEEL CO.

Vol. LXXI THE IRON TRADE REVIEW No. 11
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Cleveland, September 14, 1922

Capacity Resumes More Rapidly

From 15 to 20 Blast Furnaces Starting This Week—Steelworks and Finishing Mills Keeping Pace—Coal Supplies More Liberal and Price Drops—Iron and Steel Market More Stabilized but Strong

RECOVERY of iron and steel production in the past week has been more rapid as coal supplies have continued to grow. From 15 to 20 blast furnaces have resumed or are scheduled to go in this week, the principal gains being in the Pittsburgh, Youngstown, Chicago and northern Ohio districts. Steelworks operations have been increased fully 10 per cent in the week and are at 60 per cent or better for the entire industry. Open-hearth capacity of independent companies in the Mahoning valley is 84.5 per cent engaged compared with 76.5 per cent last week and 56 per cent two weeks ago. Finishing mill activities are following closely. This restoration of tonnage is causing a more stabilized condition of the market and buyers are feeling more confident of supplies though car shortages are proving an increasing source of trouble and are hampering shipments.

With the August steel ingot figures now available, the total loss of tonnage from the June basis can be placed at something like 650,000. August production was at the annual rate of 29,150,000 tons compared with the rate of 34,000,000 tons in July and of 36,010,000 tons in June.

Coal offerings to the mills and other manufacturing plants have expanded greatly this week with the result that the market has weakened sharply. Where some mills recently were paying as high as $10 mines to maintain operations, steam coal now is available at $4.50 or lower. The coke market has eased off $1 per ton this week though Connellsville furnace fuel at $10 is scarce, one furnace being banked this week because a further supply at this figure could not be located.

Steel Prices Strong

Prices on finished steel have become better defined this week as more tonnage has been made available in different lines. Important producers have been selling steel bars and structural shapes at 2.00c Pittsburgh and plates at 2.25c for 60 to 90 days delivery. These figures are fairly representative. All independent mills this week advanced wire products $3 per ton, or to 2.50c Pittsburgh for plain wire and 2.75c for nails. A wide range still exists on sheets with the independents naming $2 to $8 per ton above the leading interest. Northern Ohio valley sheet makers have announced an October price of 5.00c Pittsburgh on full-finished material. Sheet bars are understood to have sold up to $45 with the present minimum, $40 to $42. Warehouse prices have continued to rise at several points as stocks have fallen lower.

Roads Again Buying

Signs of renewed railroad buying evidently are influenced by the better outlook in the shopmen's strike. Placing of car orders and repairs is being resumed after some weeks of inactivity. At Chicago about 5000 new cars were inquired for this week. The New York Central railroad in the week awarded 11,100 repairs. Further inquiries for rails for 1923 delivery have come out from western roads but the mills are yet to announce the price that will apply.

Another sharp rise in THE IRON TRADE REVIEW composite average of fourteen iron and steel products is established this week by the market fluctuations. The composite is $43.80 as against $42.93 last week and $41.41 two weeks ago.

An abrupt upturn in scrap prices and demand has featured the week. Prices all around are up $1 to $2 per ton and in certain grades almost famine conditions exist because of the short supply. New York reports 50,000 tons of heavy melting steel under negotiation much of which is for delivery to Pittsburgh.

Iron Market Settling

The pig iron market presents a more settled appearance. Consumers are limiting purchases to prompt needs, apparently expecting the increased production to keep the situation easier. Continued liberal offerings and sales of English and Scotch iron $2 to $3 per ton under the domestic product also are an important factor especially in eastern territory. A sale of valley basic was made this week at $32 furnace with other negotiations continuing. Northern foundry iron is selling at $32 and upward. Some southern iron continues to be offered at $25 Birmingham. Silveries and bessemer ferrosilicon have been advanced $4 to $5 per ton.

Business Trend and Chart Section Page 705

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The Price of the Coal Surrender

WHEN the bituminous coal operators shamefully surrendered or acquiesced to the dictation of the miners's union at the recent Cleveland conference, they did more than expose themselves to the charge of having betrayed the public. They set themselves against the stream of economic readjustment which has been running its course in this country for the past 18 months. Worse, they contributed a material stimulus to a new cycle of inflation, the results of which have become quickly apparent with the ultimate extent not yet clearly to be foreseen.

Industrial wages generally based on hourly earnings have been deflated 22.4 per cent from the peak of September, 1920 and still are 98 per cent above the level of July 1914. At the same time the cost of living as calculated by the department of labor has been reduced about 24 per cent from the maximum. This readjustment of wages has applied to practically all lines of enterprise, with few exceptions. Under the terms of settlement in the bituminous industry, the principle of which subsequently was applied to the anthracite districts, the coal miners occupy a preferred position in the industrial family. They are assured for some months at least and perhaps indefinitely of the highest rates of wages ever paid in that industry which were brought about by war conditions. As matters stand, the miners have made no contributions toward lowering the cost of domestic life and toward the establishment of sounder business conditions for which the whole country has been striving for months.

The results to follow this flagrant case of class exemption and the long strike that preceded it are appearing on all sides. The recent advances in wages in steel, textiles and other lines are the direct and indirect results of the economic and moral effects of the coal malsettlement. Clearly iron and steel prices are several dollars per ton higher today than otherwise would have been the case had the coal industry done its fair part in the general deflation. The influence of this situation is bound to spread and is all the more unfavorable because it is purely the result of an artificial arrangement made in defiance of economic equilibrium.

The readjustment movement that had run through 1921 and some months in 1922 is definitely ended. The country now finds itself obliged again to face another cycle of higher wages, higher costs and higher commodity prices. This in itself necessarily would not be unfortunate were it not for its spurious origin with the general public as the victim.

Railroads Key to Fall Trade

UPON all sides it is agreed that the railroad situation constitutes the key to the industrial situation over the next few months. Speculation is rife as to whether the roads will or will not be able to meet the enormous demands upon their facilities incident to the actual fall movement of crops, of coal and of general commodities. Hampered as the roads are by the shopmen's strike, some observers believe that a serious car shortage, with all of its attendant evils upon business, is inevitable.

This prospect is not universally entertained, however. Railroad executives who maintain they have won the shopmen's strike aver with equal show of confidence that the carriers will get through the fall without any serious congestion. Their claims are lent some color by the record of what the roads have been able to accomplish in the last few months.

A point of special interest has surrounded the probable earnings showing of Class I roads for July. In that month the roads felt the full force of the combined blow of the coal and shopmen's strike. It was freely predicted that net earnings for the month would not exceed $30,000,000 or $40,000,000. The figures are now out. They reveal a net income of $69,239,000, against $76,594,000 in June and $69,298,000 in July of 1921. This was a surprisingly large return

and is held to indicate the success of the roads in dealing with the strike.

During July the roads carried 10 per cent more freight than in the same month of 1921. Coal loadings were 48 per cent less than one year before, while commodities other than coal increased 24 per cent to a total as high as loadings for the same class of freight in 1920.

Despite all the gloomy forebodings emanating from various quarters about the railroads it is evident they are sharing in the general recovery. Net operating income for Class 1 roads for seven months of 1922 amounted to $418,271,000 against $214,713,000 in the same period of 1921. It is estimated that the total net for the year will reach $900,000,000 or 5 per cent upon the $18,000,000,000 of property valuation against $615,000,000 or 3.31 per cent last year. These facts offer impressive promise of future business for the iron, steel and metalworking industries.

Opportunity for Great Service

FIFTY years ago, Charles Reade wrote a novel, *Put Yourself in His Place*. In this story, the author, always a fearless crusader against crime and injustice, laid bare the facts of British labor union policy at that time. In the guise of fiction Reade graphically sketched episodes of sabotage, of oppression and of murder. The hero of the story fought bitterly for his right—the right of man to work—a right which he was consistently denied. Many of the chapters of *Put Yourself in His Place* read like stories on the front pages of today's newspapers. But even the fertile mind of Charles Reade did not conceive wholesale slaughter such as took place this year at Herrin, Ill. He wrote of cutting of belts, destruction of equipment, setting of machines to kill their operators, of dynamiting of works, but of nothing so horrible as the massacre of unarmed men or as the abandonment of helpless women, children and sick people in a torrid desert.

Opportunity exists for a Harriet Beecher Stowe to write another *Uncle Tom's Cabin*, driving home the lesson of the right of man to work, focusing public thought on the evil of the closed shop. The stage is set for the greatest play, or the greatest novel, of the century. It is in the presence of crisis, when the public mind is aroused to imminent danger and injustice that the timely product of author or playright is assured of the warmest welcome, a welcome measured by many editions and millions of copies. The man who can write a *Put Yourself in His Place* in modern terms, with a presentday American setting, will carve out his own niche in the hall of literary fame. But, greater still, he will have served his country in helping avert the danger of purely selfish class rule, of rule of the people by the labor unions and for the labor unions.

High Class Service

Rendered by Business Trend Section Praised by Banking and Industrial Executives

WE FIND your weekly department of the Business Trend, with Mr. Hill's accompanying editorial, very useful and valuable in keeping in touch with the general trend of business conditions in the United States. In our judgment it ranks right up with the information published in the Federal Reserve bulletin and is in many respects on a par with the Harvard Economic Service.—*Bankers Trust Co., New York, Harvey E. Fisk.*

We have found THE IRON TRADE REVIEW of great value and appreciate the weekly presentation of the businesss situation. We hope to have a weekly copy always on our desk.—*Adams Foundry, Rome, N. Y., L. Adams Sprenger.*

THE IRON TRADE REVIEW is a source of great service to me, in that it keeps me abreast of the general and price conditions in the steel industry. In my opinion the Business Trend Section is a masterpiece of its kind.—*Charles Kentler, manager, J. A. Van Brunt & Co., Inc., New York.*

Machine Tool Outlook Brightens

WITH the collapse of the rail strike in sight, sellers of machine tools have reason for feeling considerably encouraged. Since early this summer numerous railroad lists have been held up, pending a strike settlement but within the past several weeks, the situation has become less tense. Some of the middle western railroads have closed on heavy requirements, indicating the urgent need of new equipment, and, a growing appreciation on the part of the larger buyers that prices on machine tools have taken a definite turn upward.

That the railroads, once their labor difficulties are settled, are likely to become active factors in the market is indicated not only by present pending lists and large purchases reported recently in some quarters, but by their improved financial status, as compared with other years, and their ability and willingness to close on relatively large lists of other equipment. The unusually heavy traffic which in all probability will tax their facilities over the next few months, also should have a favorable influence.

Let develop even a fair portion of the railroad buying now in prospect, adding to it the beneficial effects to be shared by business generally, and the termination of the rail strike will have accomplished much for the good of the machine tool industry as well as for all business.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

September 13, 1922	September 6, 1922	August, 1922	June, 1922	September, 1921	September, 1913
$43.80	$42.93	$39.79	$36.96	$35.34	$25.55

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Composite Market Record by Months for Nine Years on Page 752

SCRAP PRICES, PAGE 750, WAREHOUSE, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 746

Iron and Steel Prices

Pig Iron

Bessemer, valley	$33.00 to 34.00
Bessemer, Pittsburgh	34.76 to 35.76
Basic, valley	32.00 to 35.00
Basic, Pittsburgh	33.76 to 36.76
Basic, Buffalo	32.00 to 34.00
Basic del., eastern Pa.	30.00
Malleable, valley	34.00 to 35.00
Malleable, Pittsburgh	35.76 to 36.76
Malleable, Chicago	32.00
Malleable, Buffalo, furnace	35.00 to 36.00
Malleable, del., eastern Pa.	36.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del. Phila.	35.26 to 38.13
No. 1X, Buffalo	36.00 to 37.00
No. 2 foundry, valley	35.00 to 36.00
No. 2 foundry, Pittsburgh	36.76 to 37.76
No. 2 foundry, Buffalo	34.00 to 35.00
No. 2 foundry, Chicago	32.00
No. 2 foundry, Granite City	33.00 to 34.00
No. 2 foundry, Ironton furnace	34.00 to 35.00
No. 2 foundry, Cleveland del.	36.50
No. 2 foundry, del., Phila.	33.26 to 35.76
No. 2 foundry, N. J. tidewater	33.26 to 36.64
No. 2X, eastern del., Phila.	34.26 to 36.64
No. 2X, east. N. J. tidewater	34.39 to 36.76
No. 2X, eastern del. Boston	33.65 to 34.65
No. 2X, foundry, Buffalo fur.	35.00 to 36.00
No. 2X, Buffalo del. Boston	35.91 to 36.91
No. 2 southern, Birmingham	27.00 to 30.00
No. 2 southern, Cincinnati	31.05 to 34.05
No. 2 southern, Chicago	29.00 to 34.00
No. 2 southern, Philadelphia	30.80 to 35.80
No. 2 southern, Cleveland	26.00 to 27.00
No. 2 southern, Boston	27.89 to 29.60
No. 2 southern, St. Louis	30.17 to 35.17
No. 2X, Virginia furnace	33.00
No. 2X, Virginia Philadelphia	38.17
No. 2X, Virginia Jersey City	38.54
No. 2X, Virginia Boston	38.92
Gray forge, eastern Pa.	31.50 to 32.50
Gray forge, val. del. Pitts.	35.76 to 36.76
Low phos., standard, valley	38.00 to 39.00
*Low phos., standard, Phila.	41.00 to 43.00
*Low phos., Lebanon furnace	35.00 to 38.00
Charcoal, Birmingham	32.00 to 34.00
Charcoal, Superior, Chicago	36.15

*Nominal

Silvery Iron
8 per cent base

Jackson county, O., furnace	$41.50
Tennessee, Chicago delivery	Nominal
Ohio brands, Chicago	46.29

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	$49.50 to 50.50
11 per cent	52.80 to 53.80
12 per cent	56.10 to 57.10
13 per cent	58.00 to 59.00
14 per cent	66.10 to 67.10

Ferroalloys

Ferromanganese, domestic delivered, Pittsburgh	$74.79 to 79.79
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	67.50 to 75.00
*Ferromanganese, 80 per cent, German, c.i.f. Atlantic port	68.00
Spiegel, 19 to 21 per cent furnace spot nominal	38.00
Spiegel, 20 per cent English, c.i.f. Atlantic port	38.50 to 39.00
Ferrosilicon, 50 per cent contract freight allowed	55.00 to 65.00
Ferrotungsten, standard, per pound contained	45.00 to 50.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, per pound contained, makers plant	12.00c
Imported ferrochrome, 4 to 6 per cent carbon	10.00c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$11.00 to 12.00
Connellsville foundry	12.00 to 14.00
Pocahontas furnace	12.00 to 13.00
Pocahontas foundry	nominal
New River furnace	11.00 to 12.00
New River foundry	14.00 to 15.00
Wise county furnace	11.50 to 12.00
Wise county foundry	13.50 to 14.00
Alabama furnace	6.00 to 8.00
Alabama foundry	8.00 to 9.00

By-Product

Foundry, Newark, N. J., del.	$14.84 to 16.02
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	16.50
Foundry, Granite City, Ill., ovens	12.00
Foundry, Alabama	7.00 to 8.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$40.00 to 42.00
Open-hearth, Youngstown	40.00 to 42.00
Open-hearth, Philadelphia	45.17
Bessemer, Pittsburgh	40.00 to 42.00
Bessemer, Youngstown	40.00 to 42.00
Forging, Pittsburgh	45.00 to 50.00
Forging, Philadelphia	50.17

SHEET BARS

Open-hearth, Pittsburgh	$38.00 to 40.00
Open-hearth, Youngstown	38.00 to 40.00
Bessemer, Pittsburgh	38.00 to 40.00
Bessemer, Youngstown	38.00 to 40.00

SLABS

Pittsburgh and Youngstown	$40.00 to 42.00

WIRE RODS AND SKELP

Open-hearth, Pittsburgh	$40.00 to 42.00
Open-hearth, Youngstown	40.00 to 42.00
Bessemer, Pittsburgh	40.00 to 42.00
Bessemer, Youngstown	40.00 to 42.00

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.00c to 2.25c
Structural shapes, Phila.	2.325c to 2.575c
Structural shapes, New York	2.34c to 2.59c
Structural shapes, Chicago	2.05c to 2.25c
Tank plates, Pittsburgh	2.00c to 2.25c
Tank plates, Philadelphia	2.325c to 2.825c
Tank plates, New York	2.34c to 2.84c
Tank plates, Chicago	2.05c to 2.30c
Bars, soft steel, Pittsburgh	1.90c to 2.25c
Bars, soft steel, Philadelphia	2.325c to 2.575c
Bars, soft steel, New York	2.34c to 2.59c
Bars, soft steel, Chicago	1.95c to 2.25c
Bars, forging, Pittsburgh	2.15c to 2.25c
Bars, rail steel, Chicago	1.85c to 2.00c
Reinforcing bars, Pittsburgh	2.00c to 2.25c
Bar iron, common, Phila.	2.325c to 2.425c
Bar iron, common, New York	2.34c to 2.44c
Bar iron, common, Chicago	2.25c to 2.35c

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.75c to 3.00c
Bands, Pittsburgh	2.75c to 3.00c
Cotton ties, per bundle Pittsburgh	$1.12
Cold finished steel bars, Pittsburgh base	2.50c

Rails, Track Material

Standard bessemer rails, mill	$40.00
Standard open hearth rails, mill	40.00
Relaying rails, St. Louis	28.00 to 35.00
Relaying rails, Pittsburgh	26.00 to 29.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.40c
Spikes, railroad, Pittsburgh	2.75c
Spikes, small and boat	3.25c
Spikes, railroad, Chicago	2.75c to 3.00c
Track bolts, Pittsburgh	3.75c to 4.50c
Track bolts, Chicago	3.75c to 4.00c
Tie plates, Pittsburgh	2.25c
Tie plates, Chicago	2.15c to 2.25c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.60c to 2.75c
Plain wire, Pittsburgh	2.35c to 2.50c
Galvanized wire, Pittsburgh	2.85c to 3.00c
Barbed wire, painted, Pitts.	2.75c to 2.90c
Barbed wire, galv., Pittsburgh	3.25c to 3.40c
Polished staples, Pittsburgh	2.75c to 2.90c
Galvanized staples, Pittsburgh	3.25c to 3.40c
Coated nails count keg, Pitts.	2.10c to 2.25c

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	5.50c
Sheet piling base, Pittsburgh	2.05c to 2.30c
Hot rolled strip steel, Pittsburgh stamping quality	2.75c to 3.00c
Cold rolled strip steel, hard coils, 1⅛ inches and wider by 0.100-inch and heavier, base	4.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.75c
No. 28, bessemer, Pittsburgh	3.35c to 3.75c
No. 28, open-hearth, Phila.	3.675c to 3.825c
No. 28, open-hearth, Chicago	3.64c to 3.69c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.75c
No. 28, open-hearth, Chicago	3.69c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.35c to 4.75c
No. 28, bessemer, Pittsburgh	4.35c to 4.75c
No. 28, open-hearth, Phila.	4.675c to 4.925c
No. 28, open-hearth, Chicago	4.64c to 4.69c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.50c to 2.75c
No. 10, bessemer, Pittsburgh	2.50c to 2.75c
No. 10, open-hearth, Phila.	2.825c to 3.075c
No. 10, open-hearth, Chicago	2.84c to 2.89c

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	68	56½
1 to 1½-inch, butt iron	39½	24½

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c. l.	50 off
Charcoal iron, 3¼ to 4½ inches l. c. l.	21 off
Seamless, hot rolled, 3¼ to 4-in., l. c. l.	47 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	$52.20 to 52.70
Six-inch and over, Chicago	48.20 to 48.70
Four-inch, New York	60.80
Six-inch and over, New York	55.30
Four-inch, Birmingham	44.50 to 45.00
Six-inch and over, Birmingham	40.00 to 40.50
Three-inch, Birmingham	53.50 to 54.00

Class A pipe is $4 higher than Class B. Standard fittings, Birmingham, base, $100.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, one month ago, three months ago and one year ago

	Sept. 13, 1922	Aug. 1922	June 1922	Sept. 1921
PIG IRON				
Bessemer, valley, del., Pittsburgh.	$34.76	$29.16	$26.96	$22.46
Basic valley, del., Pittsburgh....	33.76	27.96	26.96	21.56
No. 2 foundry, del., Pittsburgh..	36.76	32.76	25.96	22.96
No. 2 foundry, Chicago.....	32.00	28.60	23.25	21.75
Lake Superior charcoal, Chicago.	36.15	33.75	30.00	33.25
Malleable, valley	34.00	28.60	24.20	20.30
Malleable, Chicago	32.00	28.60	23.25	21.75
*Southern No. 2, Birmingham....	25.00	20.70	18.50	19.00
*Southern Ohio, No. 2 Ironton..	34.00	27.00	23.25	20.90
Basic eastern del., eastern Pa....	30.00	29.50	25.25	19.50
**No. 2X, Virginia furnace.....	33.00	26.00	24.50	23.00
**No. 2X, eastern del. Phila.....	34.26	32.15	27.20	21.40
Gray forge val. del., Pittsburgh..	35.76	30.16	25.96	21.96
Ferromanganese, del., Pittsburgh	72.29	72.29	72.82	66.85
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh..	40.00	35.00	35.00	30.40
Sheet bars, open-hearth, Pittsburgh	40.00	35.00	35.00	30.40
Billets, bessemer, Pittsburgh.....	40.00	35.00	35.00	29.80
Billets, open-hearth, Pittsburgh...	40.00	35.00	35.00	29.80
FINISHED MATERIAL—				
Steel bars, Pittsburgh	2.00	1.80	1.65	1.65
Steel bars, Chicago.....	1.95	1.88	1.75	1.82
Steel bars, Philadelphia	2.425	2.275	2.01	1.95

*1.75 to 2.25 silicon

	Sept. 13, 1922	Aug. 1922	June 1922	Sept. 1921
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.325	$2.125	$1.96	$1.95
Iron bars, Chicago mills.....	2.25	1.98	1.74	1.75
Beams, Pittsburgh	2.00	1.80	1.65	1.70
Beams, Philadelphia	2.425	2.325	2.01	2.00
Beams, Chicago	2.05	1.90	1.75	1.92
Tank plates, Pittsburgh.....	2.25	1.80	1.65	1.70
Tank plates, Philadelphia.....	2.675	2.325	2.01	1.95
Tank plates, Chicago	2.05	1.90	1.75	1.82
Sheets, blk., No. 28, Pittsburgh..	3.35	3.25	3.15	2.80
Sheets, blue anl., No. 10, Pitts..	2.50	2.45	2.40	2.30
Sheets, galv., No. 28, Pittsburgh..	4.35	4.25	4.15	3.80
Wire nails, Pittsburgh.....	2.75	2.40	2.40	2.85
COKE—				
Connellsville furnace, ovens.....	11.00	13.20	6.60	3.15
Connellsville foundry, ovens.....	13.00	14.30	7.20	4.30
OLD MATERIAL—				
Heavy melting steel, Pittsburgh..	19.00	17.10	17.40	13.20
Heavy melting steel, east. Pa...	16.75	15.25	15.30	11.75
Heavy melting steel, Chicago....	18.50	15.80	14.45	11.30
No. 1 wrought, eastern Pa.....	21.00	18.25	17.50	14.75
No. 1 wrought, Chicago.....	20.25	16.35	14.20	13.05
Rails for rolling, Chicago.....	19.50	16.75	15.40	13.05

**2.25 to 2.75 silicon

Iron Prices Become More Settled

Foreign Metal Continues To Be Sold Freely in East—Consumers Confining Purchases to Prompt Needs—Valley Basic Sold at $32—Furnace Production Resumes as Fuel Supplies Are Received

Chicago, Sept. 12.—Merchant production of pig iron has not been increased this week as the fuel supply is insufficient. The lack of cars is hampering shipment to some extent but in general the output is being moved. Northern iron is $32, base furnace. Sales are few, and none are over 500 tons, these being made to melters to cover definite castings contracts, and at $32, base. The sale of 1000 tons of malleable from St. Louis to a Milwaukee melter, and the sale of five carloads of charcoal iron are reported. A 200-ton lot of foundry iron has been sold to an Illinois consumer. The sale of 300 tons of low phosphorus iron also is reported. An inquiry is current for 2000 tons of charcoal and foundry iron for a Wisconsin consumer. The Sloss-Sheffield Steel & Iron Co. opened its books last week for the remainder of the year at $25, but withdrew this price at once. The Bon Air Coal & Iron Corp., Nashville, Tenn., offers a small tonnage of iron for September and October at $25.

Domestic Offerings Increased

Philadelphia, Sept. 12.—Due to increased offerings, the market for domestic pig iron is somewhat easier. Eastern foundry iron is $32 to $34 furnace for No. 2 plain (1.75 to 2.25 silicon) for October and fourth quarter delivery. Little iron is available for September delivery, and the minimum price on this is $34. Several thousand tons of standard basic iron was sold during the past week at $30 delivered, eastern Pennsylvania. Malleable iron continues high, sales being made at $35 eastern Pennsylvania furnace. Moderate sales of copper-bearing low phosphorus iron at $36 and $37 furnace are reported. Domestic copper-free low phosphorus iron is entirely nominal the price probably being $38 to $40 furnace. A total of several thousand tons of English copper-free low phosphorus iron was sold in the week at $31 to $32 tidewater. The car shortage is hampering the movement of pig iron. The Lackawanna and Erie railroads are not accepting iron for shipment. The Pennsylvania, Reading and New Jersey Central are unaffected as yet. The Virginia Iron, Coal & Coke Co. is ready to light a furnace and is offering No. 2 plain at $32 furnace plus $1 for No. 2X (2.25 to 2.75 silicon) and plus $2 for No. 1X (2.75 to 3.25 silicon). The Midvale Steel & Ordnance Co. today lighted its Coatesville furnace. A total of 5000 to 10,000 tons of foreign iron was sold here at $30 to $31 tidewater for Scotch iron of 2.50 to 3.00 silicon for October shipment. Higher was paid for September.

Foreign Iron Dominates Market

New York, Sept. 12.—Active buying continues to feature the pig iron market in this district. Most of the tonnage placed involves foreign iron. In fact, around 15,000 tons of foreign foundry are known to have been placed during the past week. In addition,

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some domestic iron also has been closed. Prices on foreign foundry are advancing and the current market now is $29.50 to $30, c.i.f. tidewater for Scotch foundry for October shipment containing 2.50 to 3 per cent silicon and 0.50 to 0.90 phosphorus. English iron for October shipment is obtainable around $1 less than the prices of equivalent Scotch iron. Merchants here say that owing to the sold-up condition of the market abroad, numerous orders which they have called have been refused. The market on eastern foundry iron continues to be quoted at around $32 to $34 furnace, for 1.75 to 2.25 silicon for October and last quarter shipment. Buffalo iron is quoted nominally at $35, base Buffalo. Central Pennsylvania foundry is bringing around $34, base furnace. Preparations are being made to blow in a number of furnaces. The Virginia Iron Coal & Coke Co. expects to blow in a furnace at an early date and has come into the market at $32 furnace for 1.75 to 2.25 silicon, $33 for 2.25 to 2.75 and $34 for 2.75 to 3.25 silicon. The Colonial Iron Co. expects to resume production at its furnace in about two weeks. The Replogle Steel Co. is putting its large Catasauqua, Pa., stack in shape for early resumption and this is expected to be lighted early in October. Eastern Pennsylvania malleable now is held at $35 furnace and carloads have gone at this figure. Lake Superior charcoal continues at $33 furnace. Some tonnage of English copper-free low prosphorus iron has been sold during the past week at $31 to $32, c.i.f. tidewater. Abendroth Bros. Co., Port Chester, N. Y., is inquiring for 1500 tons of foundry iron for the last quarter. The American Locomotive Co. is in the market for several hundred tons of foundry. The Gould Coupler Co. has not yet closed on its inquiry for 1000 tons of malleable. The Thatcher Furnace Co. Newark N. J. a few days ago purchased 1000 tons of Scotch foundry iron.

Supplies Are Further Restricted

Pittsburgh, Sept. 12.—The pig iron market as to foundry, bessemer and malleable grades at least could be summarized with "no iron." Several offers of basic, however, are noted, one involving 5000 tons from a Cleveland or Warren, O., interest at $35 f.o.b. Cleveland or valley; another lot of a Cleveland middleman involves a similar tonnage at the same figure for October delivery and 1500 tons also has been offered users in this market for prompt delivery, no price being named. The Allegheny Steel Co. is understood to have closed on one lot of basic around $32 valley and now is seeking an additional lot of 1000 tons or more. That level is the minimum price available today and from $32 to $35 valley is being quoted. Low phosphorus iron is obtainable and small lots of domestic are bringing as high as $39 valley with an even higher price indicated shortly. One lot of 2500 tons of English low phosphorus iron to arrive this month is being offered here on the basis of around $40 delivered. Bessemer iron is practically unobtainable. One inquiry involving 2000 tons is going begging. The last sales noted were on the basis of $33 and $34 valley which remains the quotable spread. The sale of a single carload of malleable was made at $32 valley but $34 to $35 now is being quoted. One or two inquires still are current involving from 300 to 1000 tons. No. 2 foundry iron (1.75 to 2.25 silicon) is in the same class as bessemer, there being an entire absence of both small and large tonnage offerings from the valley. Even southern iron cannot now be had since the railroads are not bringing it in. Birmingham, Ala., blast furnaces are said to be several thousand tons short of supplying southern needs to say nothing of the northern obligations that have recently been taken on. Buffalo iron continues to be offered here at $34 to $35 Buffalo. Not many inquiries for foundry iron are current since the general situation is well known but sellers easily could dispose of large tonnages if they had the metal to deliver promptly.

Extended statistics of European iron and steel production, American iron and steel exports and imports, page 752

Basic Tonnage Is Closed

Cincinnati, Sept. 12.—The outstanding transaction in the local pig iron market during the past week was the purchase by the Andrews Steel Co., of 5000 tons of basic. This inquiry has been out for some time and the order was placed with a local agency but the details are withheld. An Indiana melter yesterday closed for 500 tons of malleable for prompt delivery and another consumer in the same territory bought 200 tons of No. 2 northern foundry. Other recent sales, in addition to a number of single car loads, include 100 tons of northern foundry, two lots of 150 and 200 tons of southern, 250 tons of ferrosilicon, 100 tons of southern charcoal iron and 200 tons of Ohio silvery. Spot buying in small quantities keeps up well and the inquiry continues to increase daily. Southern iron purchased in July is beginning to move, several cars having been delivered during the past few days. The Tennessee Coal, Iron & Railroad Co. announces that it will put one furnace in blast at once. This output will be booked for delivery over the last quarter of their year and the first quarter of 1923 at $32 for the base grade with $2 differentials between grades. The Sloss-Sheffield Iron & Steel Co., announces a limited tonnage for last quarter delivery at $25, Birmingham base, but so far as reported none of this has been booked. Other furnaces are quoting $30 for spot and $27 to $28 for fourth quarter.

In the southern Ohio district the minimum price of $33 is said to have been eliminated and with recent sales up to $30 the market is quotable at $34 to $35, Ironton base. The Jackson Iron & Steel Co. has announced another advance of $4 a ton on all grades of bessemer ferrosilicon and silvery irons.

Will Increase Production

Buffalo, Sept. 12.—As soon as coal production reaches a stage which will assure plentiful fuel supplies here pig iron production will be materially increased, it was learned today from furnace interests. Two producers will operate at least one additional furnace each as soon as the danger of fuel shortage is past. Both expect to put in these furnaces before the end of the month. New bookings at present are light. Comparatively little fourth quarter iron has been booked except by the Rogers-Brown Iron interests, which have one large contract for steelmaking iron for that period. Prices are firm and unchanged, on a base of $35 furnace for the 1.75 to 2.25 per cent silicon.

$36 Done At Cleveland

Cleveland, Sept. 12.—At least three additional blast furnaces represented in the northern Ohio group will be producing pig iron this week. The situation from an operating standpoint is improving gradually, though iron is scarce and some sellers expect prices to go higher before increased output eases the market. A strong factor is the coke situation which still is unsatisfactory as regards to supplies and prices. Two furnaces in this territory are reported to have contracted for coke at around $11, per ton, ovens. Operators generally view the continuance of high prices of fuel as an obstruction to reductions in pig iron. Shipments are holding up well. Several lots have been sold in Cleveland and nearby for prompt delivery at $36 a ton, furnace for the base grade, this being an advance of $1 over the price obtained by the same interest in sales made a week prior. The situation in Cleveland and nearby, especially in the valley, seems to be more stringent than to the east and west, where $32 to $33 still is being done by furnaces in the northern Ohio group. A small tonnage of iron was sold to a buyer in the Pittsbugh district at $35.50, base, Cleveland, equivalent to about $36.50, valley. At the same time some iron is reported to have been sold in Cleveland recently for delivery from furnace in Chicago, taking a freight rate of about $4.50, and also some into Columbus, from Chicago, with a freight rate of $4.04. It is understood that a small quantity of southern Ohio iron is still available around $33, base, Ironton or $36.02 Cleveland. One 500-ton lot of No. 2 foundry iron and one lot of 500 tons of malleable have been sold by a lake furnace around $33, for delivery in the last quarter.

A Columbus, O., buyer has closed for 1000 tons of basic with a seller in the valley, the price not being disclosed. The market for basic is a little obscure as none of the makers in the northern Ohio group has material for sale. A few hundred tons of bessemer iron is reported as sold at $34, valley furnace. Another advance, amounting to $4, has been made by a Jackson county producer of silveries, 6 per cent now being $39; 7 per cent, $40; 8 per cent, $41.50; 9 per cent, $43.50 and 10 per cent $45. Bessemer ferrosilicon also is up $4.

Foreign Iron Still Low

Boston, Sept. 12.—One eastern Pennsylvania furnace has entered the market at $34 base furnace for last quarter and another interest with Buffalo freight rate is quoting $33 for last quarter. Foreign iron for the

same delivery is from $2 to $5 below these figures delivered to New England consumers. Continental iron has been sold during the week at $26.50 c.i.f. Boston. One round tonnage lot went to a Worcester melter at this figure. Scotch iron is offered at prices from $30 to $35 c.i.f; the actual price comparison being difficult because of varying silicon content. Southern iron has sold in lots aggregating 500 tons or more at $28 at the furnace or $34.89 delivered, Boston.

Southern Very Strong

Birmingham, Ala., Sept. 11.—With sales not as active as they have been recently and in smaller lots, the pig iron market in the Birmingham district still is very strong. General prices range between $25 and $28 for No. 2 foundry, though the latter quotation has not been done except on small lots for immediate delivery. A number of inquiries have been received but furnace interests appear inclined to hold back in quoting. Since Sept. 1 one order for 10,000 tons was booked a little under $25 for No. 2. No sales are yet heard of for 1923 delivery. Suspension of the proposed reduced freight rates to St. Louis, Cincinnati and Louisville territories, upon complaint of Central West interests, has caused little comment in this district, the rail strike and subsequent difficulties in making deliveries being the observing problem. The increase of surplus stocks of iron in the South to 72,009 tons is not regarded as an unfavorable development but merely as a reflection of recent shipping difficulties. Home consumption has been interrupted some but furnace interests having hopes that the present week will see the end of the rail strike.

Charcoal is selling at $34 though the demand is not for any great tonnage.

Little Tonnage Is Offered

St. Louis, Sept. 11.—While the demand for pig iron in this district is neither broad nor urgent, the market holds extremely strong. Little iron is being offered from any quarter and local producers and selling agencies are receiving a heavy demand from outside points. The range on southern iron has been advanced to $25 to $30 base, while northern is firmly held at $32. As has been the case for a month or more, considerable tonnages are being shipped by the leading local producer to consumers at distant points which usually are not served. During the past several days such shipments included 1000 tons to a Wisconsin melter, and smaller lots to Ohio, Indiana and Pennsylvania points. Other sales reported were 1000 tons by a southern furnace, 500 tons of which went to a local job foundry, 300 to a leading stove interest and the balance to specialty makers. A local pulley manufacturer took 350 tons of southern iron, and an Iowa melter, 150 tons. A majority of the leading consumers of foundry iron in the district are well covered by contract, but all are experiencing difficulties in connection with deliveries. Shipment by rail from the South is exclusively on special permits. The movement by barge continues on a fairly satisfactory basis.

Coke Prices Holding Up

Tonnage Sales Lacking, with Furnace Grade Quoted $11 to $12, and Foundry, $12 to $14—Output Shows Little Improvement

COKE PRICES, PAGE 684

Pittsburgh, Sept. 12.—Tonnage sales of beehive coke still are lacking, because production so far as the Connellsville merchant ovens are concerned shows but little improvement. Several furnace coke inquiries are in the hands of prominent coke operators here from users who will be interested whenever the strike in the Connellsville region is ended since they cannot afford to pay $10 and more for their coke supplies, the ruling level at present. The Shenango Furnace Co. continues to operate its blast furnace, buying coke from time to time as excess tonnage becomes available, but the Weirton Steel Co., had to bank its blast furnace late last week as it could find no more $10 coke. It will pay up to that figure for 200 cars or more. From $11 to $12, however, is the quotable market on the furnace grade today, while $12 to $14 is the spread on 72-hour fuel. The A. M. Byers Co. is scheduled to blow in its Mattie furnace at Girard, O., soon and the Trumbull-Cliffs Furnace Co. expects this week to blow in its furnace at Warren O., which requires 18,000 tons of coke monthly. Both companies are understood to have been negotiating with by-product coke makers including the Youngstown Sheet & Tube Co. for their requirements. A 10,000-ton lot of Fairmont, W. Va. by-product coke recently was sold to other than blast furnace interests at around $10.50, Connellsville base. Inquiries for foundry coke are fairly numerous in small lots and buying easily absorbs production. Several lots of heating coke for domestic purposes and for schools have brought as high as $14, ovens. Production, according to the *Connellsville Courier*, for the week ended Sept. 2 was 90,300 tons as compared with 86,100 tons the preceding week.

Shipments Improving

Cincinnati, Sept. 12.—There is limited demand here for foundry coke but furnace grades are under strong buying pressure and more sales are being made. Shipments are better and the general situation appears to be slightly improved. A few carloads are arriving from the South. Tonnages purchased in the Alabama district in July began to arrive here late last week. One sale of 800 tons of foundry coke to a consumer in northern Indiana is reported by a local seller for promot delivery. A foundry at Columbus, O., has contracted for 15 cars to be delivered in the next 60 days. The supply of Pocahontas foundry is said to be exhausted. The furnace grade sold here this week at $12, ovens. Indianapolis by-product producers are said to have contracted for the delivery of a considerable tonnage over the remainder of the year on a basis of $11, Connellsville.

Expect Lower Prices

New York, Sept. 12.—Demand for coke is much less active in this district. This is due to a considerable extent to the fact that consumers expect lower prices. Current sales of spot foundry coke are being made at $13.50 to $14, Connellsville. Furnace coke is quoted at $11.50 to $12.50, Connellsville, and some tonnage is being sold at these prices to other than furnace users. The Seaboard By-Products Coke Co. continues to quote $14 ovens, on by-product foundry coke, equivalent to $14.84 to $16.02, delivered at Newark and other northern New Jersey points.

Southern Furnace Coke $7

Birmingham, Ala., Sept. 11.—Coke production in Alabama is maintained at a high rate, and there is demand for all tonnage that can be delivered. Transportation facilities are unsatisfactory, but a considerable tonnage is being shipped out, box cars being used for some of it. Deliveries within the district are much better. Quotations on furnace coke are as low as $7, and on foundry fuel prices range from $8 to $9.

Situation Much Improved

St. Louis, Sept. 11.—The coke situation here and to the west is easing up, in point of supplies and prices. More tonnage is arriving from Connellsville and other eastern fields, and there is less complaint relative to deliveries from southern ovens. By-product plants in the district have not experienced much improvement in coal supplies. One Indiana producer has withdrawn from the market because of lack of coal. The coal situation has undergone distinct improvement, tonnages from the adjacent Illinois fields beginning to move in satisfactory quantity. Two leading rolling mills which had been idle for several weeks because of inability to secure coal started up on Sept. 5.

Brazil Ore Sold Higher

New York, Sept. 12.—A cargo of manganese ore for prompt shipment from Brazil has been sold during the past week at 29½ cents per unit at tidewater. The price, which as usual includes the charge for loading the ore on cars at seaboard, is ½ cent higher than the last price done on Brazilian ore. This is due to the extent to which the heavy business of late has depleted the supply of manganese ore available for prompt shipment from Brazil.

Alabama Stocks Gain

Birmingham, Ala., Sept. 11.—Pig iron stocks in Alabama on Sept. 1 amounted to 72,009 tons, an increase of 35,601 tons. Of the total 58,349 tons was foundry iron, 4813 machine-cast, 7147 basic and 1700 warrant iron. The tonnage on Aug. 1 totaled 36,408 of which 24,926 was foundry, 996 machine-cast, 8486 tons basic and 2000 tons on warrant yards. The rail strike is responsible for the increase in stocks the past month.

Bar Booking Still Heavy

Demand Still Is Far in Excess of Shipments—Delivery Biggest Problem of Producers—Prices Are More Clearly Defined

BAR PRICES, PAGE 684

Chicago, Sept. 12.—Meeting delivery requirements is the largest problem faced by producers of soft steel bars as bookings continue in excess of shipments. So heavy a tonnage is being carried on mill books that rolling schedules cannot be devised to meet the requirements of users without delays. With an increase of about 10 per cent in steel production, the Illinois Steel Co. at Chicago still finds its deliveries falling back. Inquiry is the heaviest in 18 months, in the experience of important producers. Bookings continue week after week at about the same rate, always in excess of shipments. Soft steel bars are quoted at 1.95c to 2.10c, Chicago mill, by most producers, while one independent mill, fortunately able to make reasonably prompt delivery, is obtaining as high as 2.50c, mill.

Bar iron at a range of 2.25c to 2.50c, Chicago mill, is in little demand, and producers are operating their mills only part time because of lack of business. The only notable inquiry now pending calls for 200 tons for a railroad. Good inquiry is being received for rail steel bars and mills in this vicinity now are quoting 2.00c, mill. Sales about balance shipments and prospects are excellent for continued operation.

Prices More Clearly Defined

Pittsburgh, Sept. 12.—Prices are more clearly defined in connection with merchant steel bars than in some time past. Several mills, out of the market for a time, again are offering tonnages and 2.25c appears the maximum obtainable. From 1.90c to 2.25c therefore represents the quotable spread although the minimum is understood to be quoted only by the Carnegie Steel Co. to its regular trade. A large independent here is quoting 2.00c while others are quoting up to 2.25c, base Pittsburgh. Considerable business is pending from agricultural implement manufacturers. Some fair sized inquiries are current although numerous users have refused to pay the 2.25c figure.

Advances are noted in connection with refined iron of about $5 per ton, the price going from 2.35c to 2.60c, base Pittsburgh, with 2.75c to 2.85c applying to less-than-carload quantities. Muck bar refined, up in like measure, is quoted at 4.25c to 4.50c; special engine bolt iron at 4.75c to 5.00c, and staybolt iron at 5.25c to 5.50c. Double refined iron is selling at 4.00c and low phosphorus melting bars slightly in advance of that figure. These higher levels were made necessary by increased fuel and pig iron costs. Demand is low but signs of improvement are more manifest.

2.00c Is Ruling Price

Cleveland, Sept. 12.—No large amount of new business in steel bars is moving but such orders as are being booked are going at a minimum of 2.00c Pittsburgh. Some independent makers now are taking business on this basis for 30 to 60 days delivery. The leading interest is not soliciting business very actively because of its heavy obligations but is understood to be quoting around 2.00c. Hoops and bands are being quoted about 2.75c Pittsburgh by some independent mills but business was taken in the week at 2.60c.

Brisk Demand in East

Philadelphia, Sept. 12.—Demand for steel bars in this territory continues brisk at 2.00c to 2.25c Pittsburgh. Shipments are obtainable at from 15 to 60 days. Most demands are for prompt delivery. Consumers are not disposed to buy ahead. All makers now are quoting 2.50c Pittsburgh on cold-rolled rounds. It is difficult to obtain forging bars under 2.50c Pittsburgh. Demand for this product is lighter.

Steel Supplies Still Short

Pittsburgh, Sept. 12.—Cold-drawn steel bar makers still feel the pinch of shortened steel supplies, one large source of hot-rolled bars having been practically closed to them since Aug. 12. Incoming business is good, large tonnages being a matter of day to day receipt. The inquiry rate is heavy and orders for a single carload at a time are numerous. Occasionally from 100 to 500 tons are bought and from time to time larger amounts are noted. The market continues unchanged at 2.50c, base Pittsburgh, carload lots, with 2.75c applying to less than carload quantities.

Nuts, Bolts and Rivets Are In Large Demand

NUT AND BOLT PRICES, PAGE 746

Chicago, Sept. 12.—Manufacturers of bolts and nuts are experiencing an active market, specifications covering the remainder of third quarter contracts coming in freely as prices are much under the present level. Contracts for fourth quarter are now being made and one western producer has booked more than 10,000,000 bolts during the past week. The new schedule of discounts announced 10 days ago is holding firmly and the market is apparently in a strong position.

Early Shipments Difficult

Philadelphia, Sept. 12.—Higher prices recently announced for nuts, bolts and rivets are being maintained. Consumers are specifying against third quarter contracts. It is now difficult to obtain early shipment.

Pleasing Orders Are Placed

Pittsburgh, Sept. 12.—Business of pleasing proportions continues to find its way to the books of nut, bolt and rivet makers in the Pittsburgh district. New inquiries are brisk. This is more pronounced in connection with nuts and bolts than with rivets. Specifications are numerous but deliveries are impaired and operations are not increasing measurably, being held up by curtailed supplies of raw material. Prices are firm.

Hoops in Fair Demand

HOOP PRICES, PAGE 684

Pittsburgh, Sept. 12.—Users of hoops and bands, or of the narrow sizes and thin gages in hot-rolled strip steel, still furnish a good aggregate demand. Makers of the latter who have to roll their material on 9-inch mills are obtaining as high as 3.00c, base Pittsburgh. The usual market price on hoops and bands, however, is 2.75c, base Pittsburgh. Several carload orders have been placed recently and occasionally 100 or 200 tons is bought at a time.

Strip Demand Is Heavy

STRIP PRICES, PAGE 684

Pittsburgh, Sept. 12.—Several orders for hot and cold-rolled strip steel were placed in this district last week by agricultural interests. Demand from the automotive field continues unabated and in fact practically every consuming line is represented in today's strip buying. Practically all orders are large, from a single carload up to several hundred tons at a time being taken. The cold-rolled grade is quoted firmly at 4.25c, base Pittsburgh, and hot-rolled at 2.75c to 3.00c, base Pittsburgh, the maximum being obtained for narrow sizes and thin gages. Some reports are being circulated to the effect that makers are extracting a premium of $5 per ton for prompt deliveries but producers here are practically a unit in denying this.

Wages of Sheet Workers Advanced 4 1-2 Per Cent

An advance of 4½ per cent will be made in wages of sheet workers for September and October in those mills having an agreement with the Amalgamated Association of Iron, Steel and Tin Workers. The average selling price of plain sheets, gages 26, 27 and 28, in July and August was 3.05c per pound, compared with 2.90c per pound in May and June. Following are the average selling prices on which wages for the respective periods were based:

September-October	3.05c	+ 4½	per cent
July-August	2.90	+ 3	per cent
May-June	2.80		unchanged
March-April	2.80		unchanged
January-February, 1922	2.80	+ 1½	per cent
November-December	2.75	—10½	per cent
September-October	3.10	—15	per cent
July-August	3.85	— 3	per cent
May-June	3.95	—10½	per cent
March-April	4.30	—25½	per cent
January-February, 1921	5.15	—19½	per cent
November-December	5.80	+ 3	per cent
September-October	5.70	— 1½	per cent
July-August	5.75	—21	per cent
May-June	5.05	+12	per cent
March-April	4.65	+ 9	per cent
January-February, 1920	4.35		unchanged
November-December	4.35		unchanged
September-October	4.35		unchanged
July-August	4.35		

No change will be made in wages of tin mill workers for September and October, the average selling price per base

box in July and August having remained at $4.65. Comparisons follow:

September-October	$4.65		unchanged
July-August	4.65		unchanged
May-June	4.65	— 2	per cent
March-April	4.75	— 1	per cent
January-February, 1922	4.80	— 4	per cent
November-December	5.00		unchanged
September-October	5.00	—19	per cent
July-August	5.05	—11	per cent
May-June	6.50	—14½	per cent
March-April	7.15	—13½	per cent
January-February, 1921	7.75		unchanged
November-December	7.75	+ 7½	per cent
September-October	7.40		unchanged

Wire Rope Plant Bought

New York, Sept. 12.—Organization of a new company to take over the wire rope plant at Belleville, N. J., of the Upson-Walton Co. of New York, is being effected. It is understood details of the transfer of the plant were completed several weeks ago, the buying interests paying $700,000 for the Belleville plant, terms being $100,000 down and $150,000 within 30 days. The Upson-Walton company as security for the balance will retain stock in the new company until the full amount has been paid. The new organization, it is understood, in addition to the Upson-Walton plant is negotiating for the purchase of several other wire plants in the East and in the Pittsburgh district.

Nagle Plants Sold

Philadelphia, Sept. 12.—Creditors of the Nagle Steel Co. have approved the sale of the Seyfert, Pa. and Pottstown, Pa. plants to George H. Heck, Commercial Trust building, Philadelphia, for the sum of $91,000. Mr. Heck is to take title in three months and will organize an operating company. Dr. E. J. Porter, Security building, Pottstown, offered $28,000 for the Nagle Steel Co.'s Glasgow plant at Pottstown and $6000 for the scrap and coal on hand, representing about 75 per cent of the appraised value. A meeting is to be held shortly to act upon this offer. The National Iron bank of Rahway has offered to buy the Rahway, N. J. plant of the Nagle company assuming the mortgage, taxes and all liabilities. This offer totaling about $50,000 will be considered soon. The Nagle Steel Co. owns and operates a steel plant of two basic open-hearth furnaces at Rahway, N. J. and plate mills at Pottstown and Seyfert Station, Pa., the latter with an annual capacity of about 60,000 tons.

To Resume Hearings

Washington, Sept. 12.—While no official announcement has been made as yet, it is thought probable the Pittsburgh basing point case hearings will be resumed by the Federal trade commission, Sept. 25. No place has been selected, but it is thought Pittsburgh will be decided upon.

Freight Loadings High

Washington, Sept. 12.—Revenue freight loadings in the week ended Sept. 2, jumped to 931,598 cars, an increase of over 40,000. Surplus of cars in the last eight days of August was reduced to a daily average of 70,455 against a shortage of 58,670.

Plate Buying Less Active

Easier Tone Noted in Market, Especially in East Where Production Is Gaining Rapidly—2.25c Now General Price

PLATE PRICES, PAGE 684

New York, Sept. 12.—Most of the current plate business in this district involves small or moderate lots for the earliest shipment obtainable. Consumers are avoiding the placing of business for distant delivery. The market shows an easier tone. While a number of makers are asking 2.50c, base Pittsburgh, the usual price which is being done is 2.25c, base Pittsburgh. It is difficult, however, to shade the latter quotation on any tonnage for reasonable delivery. Current deliveries now range from approximately three weeks to 90 days, depending upon the dimensions of the plates and the character of the material. The Texas Co., which recently inquired for several thousand tons of plates for delivery at Port Arthur, Tex., has not closed. The Standard Oil Co. of New Jersey has not acted on its inquiry for 500 to 600 tons of plates. The American Locomotive Co. has taken prices on 1000 tons of plates.

Production Increasing

Philadelphia, Sept. 12.—Plate demand is smaller due to the disposition of buyers to postpone purchases when possible. Some business has been done at 2.50c, Pittsburgh, but the majority of sales are on a basis of 2.25c. The latter seems to be the minimum as large consumers are paying the price. A lot of 500 tons has been placed by the Pennsylvania railroad for 15 locomotives, and the Baldwin Locomotive Works has placed considerable tonnage. The latter interest is inquiring for 500 tons for 10 locomotives for the Western Maryland railroad. Eastern production is heavy. The Central Iron & Steel Co. in August produced over 16,000 tons of ingots, this being a record. The Lukens Steel Co. now has 14 furnaces operating with oil. The Midvale Steel & Ordnance Co. has increased its operations. Coatesville, Pittsburgh and western makers are able to take more tonnage due to their larger coal receipts.

Fair Tonnages Bring 2.25c

Pittsburgh, Sept. 12.—Fair tonnages of plates are being sold as high as 2.25c, base Pittsburgh, in this district, one maker taking a total in excess of 1000 tons from two or three customers on that basis after having been out of the market for a period. The Carnegie Steel Co. is understood still to have a 2.00c base Pittsburgh level for its customers on such business as it will accept, while independents are quoting 2.15c to 2.25c, base Pittsburgh. Plate business is not so large as it was expected to be, many users saying they are unable to pay the 2.25c level. A few inquiries are out, including some from boilermakers, river steamboat and barge builders and tank builders.

Some Plates Available

Chicago, Sept. 12.—Although heavy demand for tank and car building has given mills large orders for plates, it is still possible to buy moderate tonnages of sheared plates from an independent mill at Chicago for fourth quarter delivery. On this business the quotation is 2.30c, Chicago mill. At present new demand for tanks and cars is fairly light. Three tanks for a sugar refinery in California call for 663 tons and new car inquiry will furnish plate mills with a round tonnage, which probably will not be delivered until toward the end of the year. Quotations on plates range from 2.05c to 2.30c, Chicago mill.

Early Tonnage at 2.25c

Cleveland, Sept. 12.—Plates for early delivery are less freely obtainable than structural shapes and steel bars. Some independent mills consequently are quoting 2.25c Pittsburgh for 30 to 60 days delivery, though they will accept bars and shapes at less. A valley interest which is an active market factor is selling at the same price. Local mills are quoting 2.50c Pittsburgh for early shipment. The market shows a lack of large inquiries.

Ore Market Quiet; Wage Increase Not General

ORE PRICES PAGE 746

Cleveland, Sept. 12.—Final buying of iron ore for the end of the season is not developing as shippers anticipated it would, and practically no business is pending. A few sales in the 10,000-ton class have been made in the week, and a few cancellations of small tonnages are reported. Operators have not given up hope of selling some larger amounts before the season closes. Several of them have taken off boats, due to the fact that their furnaces have been unable to take the ore and the docks at the lower end of the route are full, but the boats are to be returned to service within a few days.

The recent wage increase which the United States Steel Corp. has applied to its mine operations in the Lake Superior district has not been followed by all of the other interests. Some of the latter have not changed their rates, and have no immediate plans for doing so, while others have advanced only 10 to 15 per cent.

Receipts at Lake Erie ports in August, shipments from the ports in the month, and balances on dock Sept. 1, in tons, follows:

Port	Receipts	Shipments	Balance on dock Sept. 1
Buffalo and Port Colborne, Ont.	2,337,019	159,529	281,795
Erie	269,419	279,483	443,083
Conneaut	3,782,865	3,779,557	1,501,597
Ashtabula	4,586,758	4,338,193	2,634,774
Fairport	748,062	680,123	318,227
Cleveland	4,327,524	2,493,719	1,534,143
Lorain	1,552,255	654,007	362,038
Huron	373,358	330,600	713,646
Toledo	694,359	414,359	274,798
Total Lake Erie	18,671,619	13,129,570	8,064,101
Comparative total for year previous	10,407,882	7,842,336	9,285,708

Scrap Prices Go Higher

Sharp Advances General Throughout the Trade—Demand Active but Lack of Railroad Stocks, Cars and Transportation Service Cuts Supply

SCRAP PRICES, PAGE 750

New York, Sept. 12.—Continued heavy buying has resulted in another general advance in scrap prices, only a few grades not being affected. Heavy melting steel, borings and turnings and wrought material have all made advances ranging from 50 to 75 cents and in the case of iron car axles, which are exceedingly scarce, an advance of about $2 has been made. Stove plate is another item to undergo a material increase, moving up about $1. Heavy and machinery cast, however, despite the scarcity, has remained unchanged over the past three weeks. While the tonnage now active in the market is not as large as that of a fortnight ago, it still is substantial. In the case of heavy melting steel alone, it is estimated that close to 50,000 tons are now being figured. Possibly 50 per cent of this amount, however, is for delivery into the Pittsburgh district, the Jones & Laughlin Steel Co. and the Crucible Steel Co. of America being among the larger buyers. In the East, the Bethlehem Steel Co. and the Alan Wood Iron & Steel Co. are important buying factors. With operation of the railroad shops getting back to normal, more railroad scrap is being produced. However, inability to move it, due to scarcity of cars, is causing many of the railroads again to pass their usual monthly lists.

Prices Marked Up

Boston, Sept. 12.—Nearly all grades of scrap have been marked up during the week as a result of an increased demand both from consuming points outside of New England and from foundries within the district. Heavy melting steel which sold to dealers at $11.50 a week ago has recently sold in fairly round tonnages at $12.50. Cast iron borings for chemical use are in strong demand with supply scarce. One lot of 100 tons sold recently at $13.25 shipping point. No. 1 machinery is still offered at $20 delivered to consumers, but the best grade of textile castings is scarce and $20.50 has been offered. A new demand for rails for rerolling is apparent the last few days. Several sales at $12.50 shipping point have been made.

Steel Grade Scarce

Buffalo, Sept. 12.—Heavy melting steel is growing scarce in the Buffalo district. Some of the mills are paying as high as $17.50 for this material although trading is still going on at $17. Rejections are decreasing and grading is less critical. Car shortage is retarding shipments. Other materials are in good demand with prices unchanged and tending toward slightly higher levels.

Market Steadily Advancing

Pittsburgh, Sept. 12.—Due largely to increased buying of scrap on the part of consumers and to the higher prices recently paid on railroad offerings, the market steadily is advancing. Practically all grades are up this week from $1 to $2 per ton. The last sale of heavy melting steel recorded here involved 2000 tons and brought $19, but this grade cannot now be quoted at less than $19.50 to $20, slightly over the maximum being paid for the steel on the Pennsylvania railroad's eastern region list and more than $21 being paid for the steel specialties. Open-hearth operation is gaining as is blast furnace operation, but if pig iron stays in the neighborhood of $35, valley, the scrap trade believes that $24 or $25 heavy melting steel is a near future possibility. A fair sized sale of No. 1 cupola cast is noted on the basis of $22 and sheet bar crops have been sold at $22, delivered. Demands for iron stocks are increasing and since these have been fairly well depleted offerings of this character are not extensive.

Demand Shows Improvement

Birmingham, Ala., Sept. 11.—Further improvement in the demand for scrap is noted in this district. Stocks on yards are in better shape now than for a long time, recent purchases having the purpose in mind of meeting any and all demands. More scrap is being used now than for some time. Foundries and machine shops are us-

(Continued on Page 699)

Semifinished Sales Light

Little Material in Open Market Even at High Prices—$45 Asked for Sheet Bars—Forging Billets Sold at $50

SEMIFINISHED STEEL PRICES, PAGE 684

Pittsburgh, Sept 12.—Dullness continues in the semifinished market because of the fact finishing mills require the output of their semifinishing departments. This is particularly true of wire rods and skelp. On the former, $43 to $47.50 now is considered the quotable market, the latter level being reached by several independent producers on Sept. 8. Skelp demand is at a low ebb, possibly because of the high current quotations, from 2.00c to 2.50c, base Pittsburgh, representing the market, although 2.25c is the minimum figure of independent makers. Billets and sheet bars are at least $2 higher, the $38 figure having entirely disappeared. Occasionally a small order is filled for sheet bars although new demand is at a low ebb and some tonnages are on makers' books awaiting specifications. Sheet bars now cannot be obtained for less than $40, and $42 also has been quoted. Higher than $42 is understood to have been paid in at least one case. While $35 was the third quarter figure of the Carnegie Steel Co. on sheet bars, it is not expected in the trade that its fourth quarter figure will reach $40, but possibly may stop at $37.50 or $38. The price will be known late this month. Rerolling billets are selling at a minimum of $40 for 4 x 4-inch. A fair sized order was taken by a southern Ohio maker at $42 in the past week. Three fair lots of forging billets were disposed of to consumers in this district in the week at $50, which represents an advance of about $5 per ton. Slabs are higher, due to scarcity. From $40 to $42 is considered the quotable market although $45 was quoted this week on some slabs 2 feet long, 12½ inches wide and 2 inches thick. On some especially large slabs $60 was quoted.

Wire Rod Prices Advanced

New York, Sept. 12.—Although steel production has increased as a result of the increased supply of coal, offerings of semifinished material are light. Since the advance in wire and nail prices, prices on wire rods have been raised by some makers. The leading interest continues to quote $43, base Pittsburgh, on wire rods but this maker has little tonnage to spare. Prices asked by the independent makers range from $45 to $47.50, base Pittsburgh. Sheet bars have sold in this district in substantial quantity during the past week at $40, base Pittsburgh. Some makers, however, are asking $45. Open-hearth rerolling billets are quoted nominally at $40 to $42.50, base Pittsburgh, and forging billets at $45 to $47.50, base Pittsburgh.

Stock Billets Sold at $40

Cleveland, Sept. 12.—The leading maker of semifinished material in this district has sold a small tonnage of billets from stock at $40. This was made up for export some time ago. Otherwise, it is sold up and has nothing to offer for the present. Buyers are still looking for sheet bars and slabs, and there is some talk here of the market going to $45 for these products. In fact it is understood some sheet bars have been sold up to $45.

Forging Billets $45 in East

Philadelphia, Sept. 12.—While good sales of open-hearth forging billets in the West have been made at $50, Pittsburgh, $45 Pittsburgh, is the price here. It is unnecessary to pay more for material for September and October, although $1 or $2 more is asked for the fourth quarter. Several thousand tons of rerolling billets were sold in the week at $40, Pittsburgh. Wire rods have been sold at $48 to $50, Pittsburgh, but these prices are special. The usual figures are $45 to $47.50. The leading maker continues its price at $43, but practically is not selling. Sheet bars are nominal at $40, Pittsburgh.

Talk Fourth Quarter Bars

Youngstown, O., Sept. 12.—Several lots of sheet bars, involving several hundred tons each, have just been taken by a valley producer at $40, Youngstown. While some talk is heard of fourth quarter sheet bar prices, none yet has been made. General opinion

inclines to a price somewhere between $40 and $45, Youngstown and Pittsburgh, for that delivery.

Tin Plate Tonnage

Being Placed By Canmakers to Fill Out Needs—Mill Stocks Low

TIN PLATE PRICES, PAGE 684

Pittsburgh, Sept. 12.—Representative tonnages of tin plate continue to be booked. One sale last week involved in excess of 150,000 base boxes and was from a mid-western can company. Several can makers failed to estimate their requirements accurately and had to place additional lots notwithstanding the fact shipments cannot commence before Oct. 15. Practically all the available stock plate has been absorbed so that possibly not more than 100,000 base boxes are left in mills, or approximately one day's production. The $4.75 per base box of 100 pounds, Pittsburgh, price is firm and if anything is becoming stronger. Among several large independent makers a persistent note is sounded in connection with the necessity for an even higher level because of increased production costs hinged upon $40 tin bars and high priced fuel. Relief in connection with fuel is not expected this year and on the same account no greatly reduced tin bar price is anticipated.

Operations among tin mills are increasing slightly, particularly in Pennsylvania, although some Ohio mills still are practically shut down. A fair average operating figure would perhaps be between 60 and 70 per cent. The Trumbull Steel Co., Warren, O., recently had 6 out of 19 tin mills working six odd turns while all 10 of the Liberty Steel Co.'s tin mills were idle. The Falcon Tin Plate Co., Canton, O., had one idle out of nine, while operation of the Wheeling Corp.'s 32 mills still is interfered with by the strike.

Warehouse Price Changes Now Are General

WAREHOUSE PRICES, PAGE 746

New York, Sept 12.—Demand for iron and steel products in the local warehouse market has slowed up a trifle, although business still is active. Shapes, bars and sheets are moving especially well. Following the advance in several items Sept. 5, no price changes have been made.

Normal Demand Reported

Philadelphia, Sept. 12.—Demand for iron and steel materials out of warehouse is maintained at from 90 to 100 per cent of what is considered normal. Prices are firm at the recently established levels.

Quote $3 Higher

Cleveland, Sept. 12.—Warehouse interests here generally are quoting prices $3 in advance of prices of a week ago on steel bars, plates, shapes, hoops, etc. With the exception of blue annealed sheets, however, quotations on sheets are unchanged. New prices are: Steel bars, 2.81c; shapes and plates, 2.91c; hoops and bands, 3.61c. The leading interest is quoting blue annealed sheets 3.76c, but other sheet jobbers are still quoting the old price of 3.50c.

Sheet Demand Sustained

Buyers Increase Tonnages, Anxious To Place Business at Present Levels—Full-finished for October, 5.00c, Pittsburgh

SHEET PRICES, PAGE 684

Pittsburgh, Sept. 12.—Sustained demand is the feature of the sheet market. As usual, however, in a period of good business considerable difficulty is experienced by makers in the execution of orders. Buyers are anxious to gain places on makers' books and ask for double the tonnage they require, anticipating higher price levels soon. Sheet business placed recently has been so heavy that unless mill operations increase materially some tonnages will be carried over into next year, although with increased fuel supplies higher operating rates gradually are being attained. The American Sheet & Tin Plate Co. scheduled to operate this week 65 per cent of its hot mills and hopes to exceed that figure. On Wednesday four sheet mills at its Mercer works, Farrell, Pa., are scheduled to be added while the remaining four are ordered on the following Sunday. Its specification receipts on practically all grades of sheets are heavy, including automobile. Price differentials still are noted. While one or two independent producers are understood to be taking business at the levels maintained by the leading interest, namely 2.50c, 3.35c, 4.35c and 4.50c, base Pittsburgh, on blue annealed, black, galvanized and full-finished sheets, respectively, others are from $2 to $8 per ton above those levels, particularly on black and galvanized on which as high as 3.75c and 4.75c, respectively, have been quoted. The blue annealed situation is particularly tight because of a shortage of slabs. Independent prices run as high as 2.75c, or $5 per ton higher than the American company's level. The same ratio of difference is noted on full finished automobile sheets, on which 4.75c has been quoted from independent sources. One or two independent makers will not accept business beyond what they can ship in October and will not name a price for later delivery until the fuel and raw material supply situation becomes more clarified. Sheet mills generally are up against a severe shortage of box cars. They also note a shortage of men. On $40 sheet bars, which price appears to be the minimum of the present market, some fairly representative mills claim to be unable to convert black sheets at a cost of less than 3.72c.

Demand Less Urgent

New York, Sept. 12.—Buying of sheets in this district is considerably smaller in volume than a week ago and some of the prices asked at that time no longer are heard. Production has increased owing to the increased supply of coal and it is easier to get early deliveries. It is easy to place sheets for shipment in four to six weeks. Current prices on galvanized sheets range from 4.50c to 4.60c, base Pittsburgh. In most cases black sheets are quoted at 3.50c, base Pittsburgh, although in some instances, 3.60c is asked. While blue annealed sheets can be had at 2.50c, base Pittsburgh, the usual figure is 2.60c. With some makers 2.75c is the minimum on blue annealed.

Eastern Makers Ask Premium

Chicago, Sept. 12.—Purchase of steel sheets by consumers in the Chicago market is a difficult matter. The principal producer is selling conservatively for fourth quarter, while the Inland Steel Co. has divided among its regular customers all the tonnage it believes it will be able to produce to the end of the year. Should operating conditions improve this interest may have a small additional tonnage to offer late in the year. The market is uniformly on the basis of 2.50c, Pittsburgh for blue annealed, 3.35c for black and 4.35c for galvanized. Producers who are able to furnish any prompt tonnage are asking $2 to $5 above this range.

Black and Galvanized Easier

Philadelphia, Sept. 12.—The tendency toward higher prices in the sheet market in this district has given way to softer tone in respect to black and galvanized. Black sheets generally are 3.50c, Pittsburgh. Some makers are asking 4.60c for galvanized but the price generally is 4.50c. Blue annealed is 2.60c to 2.75c. Considerable business has been done at the latter figures.

Full-Finished Sheets 5.00c

Youngstown, O., Sept. 12.—Full-finished steel sheet makers in northern Ohio have announced a price of 5.00c, Pittsburgh, for No. 22 gage for delivery in October. They are taking no business for delivery extended further than next month until the sheet bar price for fourth quarter delivery becomes more clearly defined. It is understood some other makers of this grade of sheets, which are well sold out, are asking 4.75c, Pittsburgh. Sheet demand continues heavy from all directions, from miscellaneous consumers as well as automotive and agricultural implement makers. Inquiry is so heavy that orders are being selected, old customers being given preference on mill books. The general minimum quotation on No. 28 black is 3.50c, and up to 3.75c, Pittsburgh, has been paid. No. 28 galvanized sheets follow these levels with the usual differential of 1c higher. Blue annealed sheets are commanding generally 2.75c, Pittsburgh.

The Amalgamated association sheet wage settlement Monday here, developing a general average of 3.05c, Pittsburgh, for 26, 27 and 28 gages, indicates that considerable lower-priced tonnage got into the settlement from the July-August shipments. Considerable 3.15c business went in, with most consumers taking advantage of the 2½ per cent discount for 10 days, and also some 1.90c orders. The higher quotations which set in in August and still continue did not figure in the calculation, evidently. Conviction is growing that considerable of the third and fourth quarter higher-priced business will be carried over.

Shape Awards Are Fair

New Projects Continue To Be Placed Despite Filled-Up Condition of Mills—Inquiry Rate Good—Prices Are Firm

STRUCTURAL TRACK MATERIAL PRICES, PAGE 684

New York, Sept. 12.—While the volume of small, miscellaneous inquiries for shapes is being well maintained, few sizable tonnages are coming out. In view of recent activity this development is not unexpected, and is of little significance to the trade. Prices continue strong, although virtually unchanged from last week. Where deliveries are not of special importance as low as 2.00c, Pittsburgh, can be done. But for relatively good delivery, the market for the most part, range around 2.10c to 2.25c Pittsburgh. A shortage of cars is tending to offset advantages of somewhat increased production, especially noticeable in the Pittsburgh district. A leading award involves 2000 tons of shapes for the proposed Butler warehouse in Long Island City. The Roosevelt hotel, this city, involving approximately 500 tons, and noted recently as contemplated, will not likely come up for figures before the end of next month.

Smaller Lots Bought

Philadelphia, Sept. 12.—Shape buying is in smaller tonnages. Consumers are postponing action wherever possible. Prices are 2.00c to 2.25c, Pittsburgh. Eastern shape production is increasing.

All Shapes Well Booked

Boston, Sept. 12.—Building awards in New England continue heavy and prices of fabricated steel are advancing. This is not so much a result of conditions at mills as it is of local causes. Fabricating shops are nearly all booked to capacity for some months to come and have taken an independent attitude toward new work. For this reason several jobs have been placed outside of the district. Quotations on fairly large jobs recently have been on a 2.25c, Pittsburgh base.

More School Work Out

Cleveland, Sept. 12.—Business in structural shapes has grown quieter, no awards of size being reported for the week. Besides the Collinwood high school job, requiring 1500 tons, on which bids close Sept. 18, another school project, calling for 1000 tons, is reported up for figures, bids to close Sept. 25. While quotations on structural shapes range from 2.00c to as high as 2.50c, Pittsburgh, some surprisingly low prices were reported done on some large tonnages placed here recently. On one round lot erected the successful fabricator's bid was $10 a ton less than its nearest competitor's and the plain material figures back to around 1.40c Pittsburgh. Due to delivery conditions, fabricators are now inclined to take on new tonnage.

Delivery Service Still Poor

Pittsburgh, Sept. 12.—Service from steel mills is not greatly improved as far as structural shapes are concerned. Among the structural capacity still idle is the beam mill of the Midvale Steel & Ordinance Co. Inquiries for small tonnages, 25 to 50 tons each, are numerous and a few between 50 and 200 tons also are noted. In this district it appears most of the larger jobs have been closed for the time being although the Weirton Steel Co.'s new mill will require approximately 2000 tons. This is the largest job pending. Structural material is quoted at 2.00c to 2.25c, the former being the level of the Carnegie Steel Co. It is stated that on some of the large jobs awarded recently considerably under the 2.00c price for raw material must have applied. Most fabricators no longer are interested in large jobs, preferring to concentrate upon the small work offered.

Western Tonnage Holds Up

Chicago, Sept. 12.—Although mills are unable to make prompt deliveries on structural material, and fabricating shops are well filled, new projects continue to be placed. The past week has seen a total close to 12,000 tons in the territory west of Chicago. This business is well distributed among fabricators and competition for business continues keen. Plain material is quoted at 2.05c to 2.20c, Chicago, but for the most part deliveries are fairly uncertain. A comfortably large volume of prospective business promises continued large buying into the winter.

CONTRACTS PLACED

Awards reported this week	**16,097 tons**
Awards reported last week	**30,714 tons**
Awards reported two weeks ago	**15,026 tons**

2500 tons for Robinson building, Los Angeles, to Llewellyn Iron Works.
2100 tons, smelter for New Cornelia Copper Co., Ajo, Ariz., to Wisconsin Bridge & Iron Co.
2000 tons, warehouse for James Butler Inc., Long Island City, N. Y., to Levering & Garrigues Corp.
2000 tons for Mayo hotel, Tulsa, Okla., to Mississippi Valley Structural Steel Co.
700 tons, Starr Piano Co. building, San Francisco, to Baker Iron Works.
663 tons for three 55,000-barrel storage tanks at Crockett, Cal., for California Hawaiian Sugar Refinery Co., to Pittsburgh-Des Moines Steel Co.
650 tons, apartment house, Park avenue and Thirty-seventh street, New York, to Hedden Iron Construction Co.
500 tons, Hilltown bridge over Salinas river, Cal., to American Bridge Co.
450 tons, hotel, Manhattan Beach, N. Y., to Paterson Bridge Co.
400 tons, addition to Prespy-Leland Co. plant, Brattleboro, Vt., to Palmer Steel Co.
400 tons, two 55,000-barrell tanks for Associated Oil Co., San Francisco, to Steel Tank & Pipe Co.
350 tons, parochial school, Brooklyn, to A. E. Norton, Inc.
300 tons, school and convent, New York, to Hedden Iron Construction Co.
300 tons for six ordnance buildings for United States navy at Pearl Harbor, T. H., to American Bridge Co.
300 tons, Crystal palace, San Francisco, to Judson Mfg. Co.
300 tons, apartment house, West Ninety-fifth street, New York, to Hedden Iron Construction Co.
250 tons, addition for Oppenheim, Collins & Co., New York, to Hay Foundry & Iron Works.
250 tons, carpenter shop for Allis-Chalmers Mfg. Co., West Allis, Milwaukee, to Milwaukee Bridge Co., Klug & Smith, general contractors.
250 tons, tranmission towers, Turlock irrigation district, Cal., to Pacific Coast Steel Co.
221 tons for power house for Crossett Lumber Co., Crossett, Ark., to American Bridge Co.
220 tons, Horn & Hardart building, Philadelphia, to McClintic-Marshall Co.
150 tons, building for Pioneer Rubber Co., Pittsburg, Cal., to Judson Mfg. Co.
150 tons, piers 44 and 22, San Francisco, to Judson Mfg. Co.
150 tons, bridge near Tillamook, Oreg., to American Bridge Co.
150 tons, Huff building, Greensburg, Pa., to Memphis Steel Construction Co.
150 tons, plant for Wyco Electric Co., Springfield, Mass., to Palmer Steel Co.
131 tons for two crane runways for Richmond, Fredericksburg & Potomac railroad, the Arnold Co., general contractors.
112 tons for bridge across Bear river, north of Auburn, Cal., for California highway commission, to Minneapolis Steel & Machinery Co.

CONTRACTS PENDING

2800 tons for bridge over Columbia river, for Union Pacific railroad, American Bridge Co. low bidder.
2000 tons, building for the Weirton Steel Co., Weirton, W. Va.; bids being taken.
1900 tons, bridge over the Westwater, readvertised by board of public works, Seattle.
1500 tons, previously reported as 900 tons, for addition to American Museum of Natural History, New York, general contract to James Stewart & Co., New York.
1500 tons, Collinwood high school, Cleveland, bids close Sept. 18.
1100 tons, grade elevation work for Pennsylvania railroad in New Jersey, bids being taken.
1000 tons, Manchester hotel, Manchester, N. H., bids being taken.
1000 tons, grandstand at fair grounds, Russell, Ky., bids being taken.
1000 tons, school, Cleveland, bids close Sept. 25.
700 tons, high school, Worcester, Mass., bids in.
500 tons, highway bridge, Clarksville, Tenn., bids being taken.
300 tons, bridge work for Missouri Pacific railroad, bids being taken.
300 tons, government hospital, Northampton, Mass., bids asked.
245 tons, power-house for Santa Fe railroad at San Bernardino, Cal., general contract to H. J. Cannon.
200 tons, substation for Cleveland Electric Illuminating Co., Cleveland, bids being taken.
150 tons, addition to Syria Mosque, Pittsburgh; bids being taken.
140 tons, addition for Maxwell Motor Co., Detroit, bids in.
125 tons, chapel for Denison university, Granville, O., bids being taken.
100 tons, addition to Vandergrift, Pa., high school; bids being taken.
100 tons, bridge for Mariposa county, Cal., general contract to Security Bridge Co.
100 tons for four bridges, state highway commission, Portland, Oreg., bids in.
Tonnage not stated, Eleventh avenue school, Columbus, O., general contract to D. W. McGrath Co.

Spread of $3

Per Ton on Wire and Nails Appears—Demand Continues Heavy

WIRE PRICES, PAGE 684

Pittsburgh, Sept. 12.—On Sept. 8 the spread in wire and wire products prices again was restored due to the fact that independent makers took the initiative in inaugurating higher levels of $3 per ton. While the American Steel & Wire Co. still is understood to be quoting 2.35c on wire and 2.60c on wire nails on such business as they will accept, independents now are practically a unit in quoting 2.50c for the former and 2.75c for nails, 2.25c being the new figure of cement coated nails. The independent which two or three weeks ago was quoting 3.25c on nails has joined the others in naming the 2.75c figure. The new discount on woven wire fencing either in straight carloads or in connection with mixed carloads including 1000 rods or more, is 68 per cent off. One maker, however, is quoting 69½ off, with 68½ per cent applying to less-than-carload quantities. The fall

fencing season now is under way and demand is good for this product. Requests for shipment of all kinds of Wire products are particularly heavy since order books are well filled up with business booked at lower levels than those now prevailing. New business among jobbers is fair, indicating that the demand among retailers still is at a high point. Wire mills continue to experience considerable difficulty in making shipments because of a box car shortage and in connection with numerous short hauls have had to use open top cars.

Spread Reappears in Wire

Chicago, Sept. 12.—After a short period, during which practically all producers of wire and nails were quoting uniformly, a spread of $3 per ton has appeared, the leading producer quoting 2.60c, Pittsburgh, on nails, and 2.35c, Pittsburgh, on wire. The principal independents are now taking business at 2.75c, Pittsburgh, for nails and 2.50c, Pittsburgh for wire. Inquiry for nails is unusually heavy and in wire more business is being offered than can be booked. Users of barbed wire are asking large tonnages and manufacturers are in the market for much tonnage. As a result of this situation, producers of wire and nails are limiting sales and have less production than they need to care for requirements of their regular customers. Bookings exceed production and deliveries are being extended further each week.

Independents Quote Evenly

Philadelphia, Sept. 12.—All independent mills now are quoting plain wire at 2.50c and wire nails at 2.75c Pittsburgh. It is difficult to obtain deliveries on wire products under 30 days but some mills again are shipping nails from stock.

Unfilled Bookings Gain

Unfilled bookings for the sixth consecutive time have advanced, the total, as of Aug. 31, being 5,950,105 tons, as compared with 5,776,161 tons July 31, and 4,494,148 March 31, when the upward movement started. The latest total is the largest since March, 1921, when unfilled bookings aggregated 6,284,765 tons. Comparisons follow:

Date	Total	Change, tonnage	Change, per cent	
Aug. 31, 1922...	5,950,105	173,944+	3.01	+
July 31, 1922...	5,776,161	140,630+	2.48	+
June 30, 1922...	5,635,531	381,303+	7.2	+
May 31, 1922...	5,254,228	157,311+	3.08	+
April 30, 1922...	5,096,917	602,769+	13.4	+
Mar. 31, 1922...	4,494,148	353,079+	8.5	+
Feb. 28, 1922...	4,141,069	100,609—	2.307	—
Jan. 31, 1922...	4,241,678	26,736—	0.0062	—
Dec. 31, 1921...	4,268,414	17,872+	0 004	+
Nov. 30, 1921...	4,250,542	36,287—	0.84	—
Oct. 31, 1921...	4,286,829	273,841—	6.004	—
Sept. 30, 1921...	4,560,670	28,744+	0.63	+
Aug. 31, 1921...	4,531,926	298,398—	6.3	—
July 31, 1921...	4,830,324	287,544—	5.59	—
June 30, 1921...	5,117,868	364,619—	6.2	—
May 31, 1921...	5,482,487	362,737—	6.2	—
April 30, 1921...	5,845,224	439,541—	6.8	—
Mar. 31, 1921...	6,284,765	649,102—	10.32	—
Feb. 28, 1921...	6,933,867	639,297—	8.21	—
Jan. 31, 1921...	7,573,164	574,958—	7.59	—
Dec. 31, 1920...	8,148,122	873,359—	9.68	—
Nov. 30, 1920...	9,021,481	815,371—	8.26	—
Oct. 31, 1920...	9,836,852	537,952—	5.16	—
Sept. 30, 1920...	10,374,804	430,234—	3.56	—
Aug. 31, 1920...	10,805,038	313,430—	5.4	—
July 31, 1920...	11,118,468	139,651+	.7	+
June 30, 1920...	10,978,817	38,751+	0.35	+
May 31, 1920...	10,940,466	580,719+	5.6	+
April 30, 1920...	10,359,747	467,672+	4.51	+
Mar. 31, 1920...	9,892,075	389,994+	3.94	+
Feb. 29, 1920...	9,502,081	216,640+	2.3	+
Jan. 31, 1920...	9,285,441	1,020,075+	11.00	+

Car Buying Is Resumed

Roads Enter Market for Additional Equipment and Repairs After Period of Quietness—Track Materials Are Active

RAILROAD TRACK MATERIAL PRICES, PAGE 684

Chicago, Sept. 12.—After a period of quietness when no new inquiries for railroad cars were received, some activity in this department has appeared. A total of 4800 cars has come out within the past week. Sales of 750 cars have been made. Track fastenings continue unusually active and a large total of spikes and bolts is being placed, one interest having booked orders for 50,000 kegs during the past week. An order for 1000 tons of tie plates has also been taken by the same producer. Much inquiry is being received for angle bars, but this is mostly for 1923 delivery.

No further actual inquiry for standard steel rails has come out, but a number of other roads are ready to place their orders for rails as soon as quotations for 1923 have been announced.

Places 11,100 Repairs

New York, Sept. 12.—Featuring the eastern car market is the award of contracts for the repair of 11,100 cars for the New York Central, Michigan Central, Big Four and the Toledo & Ohio Central railroads, this business all being placed through the New York Central offices. A leading inquiry calls for 3300 freight cars for the St. Louis-San Francisco, which is also inquiring for 50 locomotives.

Going Market Is 2.25c

Pittsburgh, Sept. 12.—On what business is being placed in light rails 2.25c, base Pittsburgh, represents the going market level, although the Carnegie Steel Co.'s price is somewhat under that figure. This latter interest was quoting 2.00c until the time it withdrew from the market and it has not announced a new price for the fourth quarter. Rerollers still continue to quote much under 2.25c and in some cases as low as 1.80c has been available from such sources. Present demands from coal fields are large, particularly in the union district where large numbers of mines are getting into operation. Several fair sized orders have been taken at the 2.25c level and more are under consideration. Several inquiries are current now for 50 to 200 tons each. Relaying rails are quoted at $26 to $29, there being no $24 to $25 rails available. Some users not ordinarily interested in 90 or 100-pound rails, are negotiating for the purchase of some fair sized tonnages of these sections. Demand for track accessories continues fair. The aggregate of business on makers' books, however, is large and spike mill operation continues up around 65 or 70 per cent of capacity. Standard spikes are quoted at 2.75c; small and boat spikes at 3.25c; track bolts at 3.75c to 4.50c, and tie plates at 2.25c, all base Pittsburgh.

Street Lines Start Buying

Boston, Sept. 12.—Street railways in New England are starting to place orders to complete their year's requirements, and while individual lots are small the aggregate expected to be purchased runs into several thousand tons. Prices are firm, tee rails selling in some cases above the $40 base. Tie plates have sold recently at 2.25c Pittsburgh. Frog and switch material has been marked up approximately 10 per cent above prices a month ago. Local rail specialty shops are busy.

Buying Is Active

St. Louis, Sept. 11.—Railroads and car builders are buying steel in quantity, the latter being in pressing need of certain materials. A local rolling mill booked 250 tons of bar iron from a car maker, at 2.30c mill. Contracts for equipment totaling $8,000,000, including 35 large mikado freight engines, 15 mountain-type passenger engines and 1000 50-ton capacity steel hopper bottom coal cars have been let by the St. Louis & San Francisco railroad. Bids also have been asked by this road on 1500 55-ton steel gondola coal cars; 1500 steel underframe automobile box cars; and 300 steel underframe stock cars.

Light Rails in Demand

Philadelphia, Sept. 12.—A large increase in light rail demand has developed due to a resumption of coal mining activity. This business is being taken at 2.00c to 2.25c Pittsburgh.

CAR ORDERS PLACED

New York Central, 11,100 car repairs as follows: 2000 box, Ryan Car Co.; 2000 box, Illinois Car & Mfg. Co.; 1000 box and 1000 gondolas, American Car & Foundry Co.; 500 box, Buffalo Steel Car Co.; and 400 gondolas, Ralston Steel Car Co., all for New York Central; 1000 box, Illinois Car & Mfg. Co. and 200 box, Streator Car Co., for Michigan Central; 1000 box, American Car & Foundry Co. for Big Four; and 500 gondolas, Ralston Steel Car Co., for Toledo & Ohio Central.

Central Railroad of Georgia, 100 flat cars to Virginia Bridge & Iron Co.

CAR ORDERS PENDING

Atlantic Coast line, 2000 box cars, inquiry revived.

Chicago & Alton, 300 cars, bids asked.

Elgin, Joliet & Eastern, 500 steel underframes, bids asked.

St. Louis & San Francisco, 3300 cars, including 1500 hoppers, 1500 box and 300 stock, bids asked.

Western Pacific, 100 gondolas, bids asked.

Baltimore & Ohio, 1000 hoppers, bids asked.

Chicago Elevated, 100 passenger cars, bids asked.

Pittsburgh, Shawmut & Northwestern, 200 stock and 50 box cars.

Studies Coal Rate Ratio

Washington, Sept. 12.—Decision of the interstate commerce commission to re-open the proceedings bearing upon the relation of Ohio intrastate coal rates to interstate coal rates probably will determine whether differentials are to be increased by a percentage when a percentage rate advance is authorized by the commission or if the differential is to remain unchanged. Prior to ex-parte 74 there was a differential of 40 cents per ton between Ohio intrastate coal rates and rates in the so-called inner crescent and 50 cents as regards the so-called outer crescent. The Ohio commission held that the 40 and 50-cent differentials should be increased 40 per cent while the railroads maintained the differentials should remain unchanged in cents per ton.

Building Bar Buying Brisk

Week's Awards Active but Fabricators Have Difficulty in Finding Steel and in Making Shipments—Higher Price Levels Continue

REINFORCING BAR PRICES, PAGE 684

Chicago, Sept. 12.—A large number of projects involving reinforcing bars is coming before the trade. The greater portion is for small tonnages but an unusually large number of more important size are offering. For the most part sellers are restricting their bookings because of difficulty in obtaining mill deliveries. Some sellers, however, seem to be able to book an unlimited tonnage and are not so much troubled about deliveries. The past week has seen an unusually large number of projects closed in the West and is the most active period in several months although the total tonnage is not equal to some previous weeks. The price of reinforcing bars continues steady at 2.50c, Chicago store, and although some talk has been heard of advancing the quotation, it has not resulted in the figure being changed. A large total of business is still pending and sales promise to continue heavy as long as outdoor work can be undertaken.

Demand in Fair Volume

New York, Sept. 12.—Demand for concrete reinforcing bars in this district is only fairly active. Due to the restricted production, however, the demand continues fully to the supply. Prices are tending a little higher and mills have no difficulty in getting 2.15 to 2.25c base Pittsburgh, for quick shipment. The minimum on concrete bars for shipment at mill's convenience is 2.00c base Pittsburgh. Bars for shipment out of warehouse stocks still are bringing 2.50c to 2.75c base Pittsburgh.

Some Sizable Jobs Up

Cleveland, Sept. 12.—Award of 300 tons for Troop A armory, this city, to the Bourne-Fuller Co. and inquiry for 1250 tons for the Bay City, Mich., water works, and an unstated tonnage for an 11-span bridge at Rathbone, O., are the outstanding features of the local reinforcing concrete bar market. Several smaller inquiries also appeared and numerous orders of carload lots are reported, the aggregate comprising business wholly desirable by fabricators who, because of delivery difficulties, prefer to avoid the larger projects. Implement manufacturers have begun to figure on their 1923 requirements of rail steel shapes and larger tonnages are being considered. Soft steel bars for reinforcing work are quoted at 2.00c, Pittsburgh while rail steel bars are quoted at 1.90c to 2.00c mill.

Several Inquiries Pending

Pittsburgh, Sept. 12.—Steelmakers have a number of concrete bar inquiries before them involving fair sized tonnages but awards this past week have been small. Shipments on orders booked some time ago are heavy. While the Midvale Steel & Ordnance Co. has furnished some of the concrete bars for the Schenley hotel and apartment house job, bids on an additional 700 to 1500 tons are being taken until Sept. 20. Concrete bars are quoted at 2.00c to 2.25c, the usual price being 2.25c, base Pittsburgh, although as high as 2.50c and even 2.75c has been obtained in a few isolated cases recently.

CONTRACTS PLACED

Awards reported this week	**9,005 tons**
Awards reported last week	**3,435 tons**
Awards reported two weeks ago	**4,205 tons**

250 tons, apartment, Washington and Gough streets, San Francisco, to Gunn, Carle & Co.
270 tons, Provident Security building, San Francisco, to Truscon Steel Co.
100 tons, Reedly joint high school, Reedly, Cal., to Kyle & Co.
280 tons, Petri Cigar Co. building, San Francisco, to Gunn, Carle & Co.
130 tons, dormitory at Leland Stanford university, Stanford, Cal., to Pacific Coast Steel Co.
150 tons, Tribune building, Oakland, Cal., to Truscon Steel Co.
400 tons office building for Clarke Estate, Kansas City, Mo., to Laclede Steel Co.
400 tons for high school at Wichita, Kans., to Concrete Engineering Co.
200 tons, filtration plant at Oklahoma City, general contract to Tebbetts & Pleasant, bars to Concrete Steel Co.
125 tons, state highway bridge at Constantine, Mich., to Corrugated Bar Co.
250 tons, A. Buthrie Co., St. Paul, for bridges in Minnesota, to Corrugated Bar Co.
170 tons, Eagles Club house, Davenport, Iowa, to Concrete Steel Co.
180 tons, school building, Mankato, Minn., to Concrete Steel Co.
700 tons, for Durant Motors Corp., Flint, Mich., to Paul J. Kalman Co.
500 tons, highway work in Illinois, to Paul J. Kalman Co.
200 tons for Reynolds Wire Co., Dixon, Ill., to Paul J. Kalman Co.
100 tons, warehouse for Standard Oil Co., Dayton, O., to Paul J. Kalman Co.
300 tons, Troop A armory, Cleveland, to Bourne-Fuller Co.; general contractor, Central States Engineering & Construction Co.
1500 tons, building for James Butler, Inc., to Corrugated Bar Co.
1500 tons, building for Standard Milling Co., Jersey City, N. J., to Hartmann, Duncan & Rogow, Inc.
500 tons for Sanford Mills, Sanford, Me., to Concrete Steel Co.
100 tons, laundry, Salem, Mass., to Concrete Steel Co.
100 tons, New Bedford Boiler & Machine Works, New Bedford, Mass., to an independent fabricator.
600 tons, Province Court building, Boston, to Concrete Steel Co.

CONTRACTS PENDING

600 to 800 tons, Chicago Trust Co. building, alternative to structural steel. Bids asked.
500 tons, south side high school, St. Louis, bids in.
300 tons, building for Western Electric Co., Chicago, bids in
300 tons, Judson hotel, Chicago, bids in.
190 tons, addition for Horlich Malted Milk Co., Racine, Wis., bids opened and work postponed to 1923.
870 tons, filtration plant, Sacramento, Cal., general contract to Matthews Construction Co.
100 tons, addition to Syria Mosque temple, Pittsburgh; bids being taken.
1250 tons, water works, Bay City, Mich., bids being taken.
115 tons, warehouse for Windermere Transfer & Moving Co., Cleveland, bids being taken.
300 tons, Roosevelt high school, Erie, Pa., H. J. Conrad Co. general contractor; steel not placed.
5000 tons, Conners creek sewer, Detroit, T. A. Gillespie Co. low on general contract.
3000 tons for pipe line, city of Tulsa, Okla., bids on general contract to be opened Sept. 25.
1000 tons for chamber of commerce building, Boston, bids asked.
Tonnage not stated, power house, Jamestown, N. Y., bids being taken.
Tonnage not stated, bridge over Menominee river at Wauwatosa, Wis., general contract to Stein Construction Co.
Tonnage not stated, 11-span bridge, each span 100 feet, over Scioto river, Rathbone, O., general contract pending.
Tonnage not stated, Eleventh avenue school, Columbus, O., general contract to D. W. McGrath Co.

Sudden Activity

Develops in Nearly All Alloys—Spiegel, Ferro and Specialties Affected

FERROALLOY PRICES, PAGE 684

New York, Sept. 12.—A flurry of activity developed in the spiegeleisen market during the past week and orders involving several thousand tons have been placed or immediate closing is assured. This activity is due to the fact that certain steel plants expect to increase their output. Most of the tonnage involved is to be shipped by domestic producers and the market as reflected is around $38, furnace, for 19 to 20 per cent metal. Approximately 1000 tons of English spiegeleisen have been sold during the past week at prices ranging from $38.50 to $39, c.i.f. tidewater, for 19 to 21 per cent metal. Sales of ferromanganese during the week involved approximately 5000 tons, all of which is for shipment from England in October and November. The price on English ferromanganese continues $67.50, tidewater.

Prospects for speedy passage of the tariff bill have aroused more activity in the tungsten market than has been noted in many months. A number of inquiries and sales have been reported and prices have advanced substantially. The entire French stock in New York store, involving some 45 tons of contained tungsten, was sold last week to a Pittsburgh district steelmaker. Subsequently the price has advanced to about 45 cents a pound contained as against 41 cents the previous week. Several sales of tungsten metal powder are reported, including one lot of 4000 pounds of material analyzing under 95 per cent tungsten, sold to a broker at 50 cents a pound contained. Another holder of higher grade tungsten powder has advanced his price from 45 cents to 50 to 55 cents. The Electric Alloy Steel Co. has inquired for 30,000 pounds of contained tungsten in alloy.

Ferrosilicon prices have shown a hardening tendency, since the advance by the leading maker to $65, delivered, but sales have been made of Canadian material at $55 and of domestic alloy at $62, delivered. A good business has been reported in 14 to 16 per cent ferrosilicon. Ferrochrome specifications have been received at a good rate. Reports of cancellations of alloy steel orders by the Ford Motor Co. have not been confirmed. Ferrochrome prices are unchanged. Ferrovanadium quotations are holding at $3.50 to $4 a pound contained, with good business reported by several makers.

More Activity Reported

Pittsburgh, Sept. 12.—Although sizable tonnages for the most part still are lacking in the ferroalloys market, some activity appears. Most of the inquiries and sales are for small quantities. A few consumers of ferromanganese who did not participate in the buying movement of several weeks ago, now are out for material. The

Canton, O., consumer which entered the market for 500 to 1000 tons of ferromanganese last week is understood to have closed on English material or is about to close. Several other inquiries for carload or 100-ton lots are noted, including one from the Acme Steel Foundry Co., Glassmere, Pa., on which $75 seaboard, is quoted. The National Cast Iron Pipe Co., Birmingham, Ala., wants a carload of ground ferromanganese. The purchase of a 7000-ton lot of manganese ore was consummated here last week. Spiegeleisen is quotable $1 per ton less than a week ago, the 16 to 19 per cent grade being held at $537, and the 19 to 21 per cent material at $38, f.o.b. furnace, by a large producer. No new inquiries are noted.

New Pipe Prices

Bring Out Little Sizable Tonnage—Steel and Cast Shops Filled

Pittsburgh, Sept. 12.—Since the announcement of higher prices on tubular goods, little has come out in the way of sizable new business, but pipe mills generally are well filled. On much of this, however, they cannot make desired deliveries. The majority of mills are from three to four months behind on deliveries of standard full weight merchant pipe due to the shortage of bessemer steel. On 6-inch casing, some plants are from six to eight weeks behind. The republic Iron & Steel Co. is starting its 20-inch skelp mill this week to satisfy its own pipe department's requirements. The usual order for pipe consists of 100 to 150 tons but these still are numerous and come from every direction. So far as reported no new line pipe tonnages are up for consideration except the usual run involving relatively small lots. Demand for wrought iron pipe still is heavy.

Demand Slows Up

New York, Sept. 12.—Municipal demand for cast iron pipe has slowed up, no new inquiries of importance being noted. The few reported recently, and which aggregate only a relatively fair tonnage, are still pending.

Shops Well Filled

Chicago, Sept. 12.—Demand for 4-inch and 6-inch cast iron pipe is so much larger than for other sizes that many shops have all they can handle of the smaller pipe and are almost out of the market. They are endeavoring to care for the late season requirements of their regular customers for such odds and ends as they require in completing extensions and are avoiding other selling. In a few cases buyers have decided to wait until 1923, when they find deliveries cannot be made under six to eight weeks. The United States Cast Iron Pipe & Foundry Co. has been awarded 800 tons at Detroit, and is low on 190 tons at Milwaukee. Bids were opened Sept. 11 at Marshalltown, Iowa, on 200 tons and at Laporte, Ind., on 700 tons. Bids will be opened at Chicago Sept. 13 on 600 tons. Prices are somewhat variable but it appears that nothing under $40, Birmingham, for the base size is now available.

The Nonferrous Metals

Lead and Zinc Going Up on Good Sales but Copper Is Relatively Quiet—Freight Situation Important

	Copper		Spot	†Lead	Zinc			
	Electro delivered	Lake delivered	Straits New York	New York basis	St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Sept. 6.....	14.00	14.12½	32.37½	5.90	6.25	18.00	5.50	32.00
Sept. 7.....	14.00	14.12½	32.37½	5.90	6.25	18.00	5.62½	32.00
Sept. 8.....	14.00	14.12½	32.25	5.90	6.30	18.00	5.75	32.00
Sept. 11.....	14.00	14.12½	32.25	5.90	6.30	18.00	5.75	32.00
Sept. 12.....	14.00	14.12½	32.12½	5.95	6.37½	18.00	6.00	32.00

†Outside market quotation.

NEW YORK, Sept. 12.—Improved shipments of coal to mills and furnaces have stimulated interest of consumers in materials requirements. This is particularly true of the sheet and tin plate mills in respect to zinc and to some extent tin supplies. Copper business has been slow; lead business active. Prices for all the nonferrous metals have shown an advancing tendency. The results of several embargoes just declared are yet to be seen. They especially hit shipments of lead and zinc from West to East.

The copper market has been relatively quiet, but firm, with offerings both by producers and second hands extremely small, due to limited output resulting from shortage of labor. Such business as reported the past week has gone at 14c, delivered, for positions up to and including December delivery. Aggregate foreign sales have been fairly satisfactory, German buying having improved decidedly the past few days. Casting copper quotations have been firm at 13.40c to 13.50c, f.o.b. refinery. Lake copper has held at 14.12½c, delivered.

Prime western zinc prices advanced over 10 points the past week to 6.35c, East St. Louis, and higher, for prompt, September and fourth quarter shipments. Galvanizers, some of whom bought rather freely for fourth quarter shipment some time ago, have been asking for shipments earlier than provided and this action, together with new purchases of prompt, is creating a tight prompt position. The American Zinc institute statistics are expected to show a substantial reduction in stocks, between 6000 and 8000 tons, during August. High grade zinc prices advanced to 7.25c, delivered. Sheet zinc base prices were advanced ¼c Sept. 11, to 8c, f.o.b. mill, with the usual extras and discounts.

A good lead business has been done and prices have advanced in the outside market to 5.65c, East St. Louis. Lead has continued available at 5.90c, New York, for prompt shipment from the West but some is as high as 6c. All the principal lines of lead consumption are holding at a high rate.

Tin prices have been easy, with comparatively little interest from consumers or professional traders, although the tin plate mills have been a little more active. The increase in world visible supplies shown as of Sept. 1 and the large stocks in New York have kept buyers feeling comfortable as to supplies. Straits tin prices have held at about 32.12½c to 32.50c the past week; 99 per cent for prompt delivery has been quoted ¼c under Straits.

Antimony quotations advanced sharply the past week, partly on tariff prospects and partly because of higher import costs. Sales were made at 6c, duty paid, in carlots, as against 5.37½c, the week previous.

Most of the principal aluminum importers have been asking prices for 98 to 99 per cent virgin ingot, also 99 per cent virgin, about equal to those asked by the domestic producer. In fact, one importer has been asking ½c over the domestic price. However, odd lots of imported aluminum have been quoted 18c, New York, against the producers' price of 19c, delivered, or 18.50c, New York. Consumers being well covered on low priced contracts entered into early in the year, new business has been light.

Mill Products

(Base prices, f.o.b. mill)

SHEETS	
Copper, hot rolled 24 oz., min	21.50
High brass	18.25
Zinc, ga. 9 to 18 (plates ½c less)	8.00
Lead ,full sheets (cut ½c more)	9.00
SEAMLESS TUBES	
High brass	22.50
Copper	24.75
RODS	
High brass, round, ⅜ to 2½ inch	16.75
Naval brass rod	18.75 to 19.25
WIRE	
Copper	15.50 to 16.00
High brass	18.75

Old Metals

(Dealers' Buying Prices)

HEAVY RED BRASS	
Cleveland	8.50 to 9.00
New York	8.50
Chicago	8.50
HEAVY YELLOW BRASS	
New York	6.25 to 6.50
Chicago	6.50
Cleveland	5.50 to 6.00
ZINC	
New York	3.25 to 3.50
Cleveland	3.00 to 3.50
HEAVY COPPER AND WIRE	
Cleveland	10.50 to 11.00
New York	11.00 to 11.25
Chicago	11.00
RED BRASS TURNINGS	
New York	7.75 to 8.00
Cleveland	7.50 to 8.00
Chicago	7.25
YELLOW BRASS TUBING	
Cleveland	5.50 to 6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	5.50 to 6.00
New York	6.50 to 6.75
Chicago	6.00
ALUMINUM BORINGS	
Cleveland	6.00 to 6.50

Mill Operations

Steadily Improving in Pittsburgh District—More Furnaces in Blast

Pittsburgh, Sept. 12.—Improvement in iron and steel mill operating conditions continues. Additional ovens being added by the H. C. Frick Coke Co. is increasing the available coke supply for the Carnegie Steel Co. which has been able to increase its blast furnace total to 36 out of 59. It is operating between 60 and 65 per cent of its steelmaking capacity. The Midvale Steel & Ordnance Co. added three blast furnaces last week, making five in blast. Jones & Laughlin Steel Co. operations are improving. Since all of its coal mines are union and are on the river, prompt deliveries of coal to its by-product plant are possible which in turn supplies the blast furnaces, 7 out of 12 being active, an additional furnace being added at Aliquippa. Approximately 60 per cent of its steel making capacity is in operation. The Pittsburgh Steel Co. still has eight open hearths on but is able only to operate one blast furnace. The Weirton Steel Co., Weirton, W. Va., on the other hand had to bank its blast furnace late last week but its finishing mills continue at a fairly high rate. The American Sheet & Tin Plate Co. has 65 per cent of its hot mill capacity scheduled this week. Four sheet mills are scheduled to go on Wednesday at its Mercer works, Farrell, Pa., and four additional will be started Sunday night. The A. M. Byers Co., Girard, O., is to start its puddling mill tomorrow and its blast furnace will follow within the next 10 days.

Conditions among the railroads are improving, although a severe shortage of good order box cars still is noted by wire sheet, tin and strip steel mills. Gains in mechanical and train maintenance departments are reported by the Pittsburgh & Lake Erie, Bessemer & Lake Erie, Buffalo, Rochester & Pittsburgh, and the Baltimore & Ohio railroads. The latter reports 711 men of the 2250 now at work at its Mt. Clare shop are men who went out on strike July 1. Improvement also is reported by the Pennsylvania railroad which states every divisional point is taking back large numbers of striking shopmen.

Valley Operating Rates Continue To Improve

Youngstown, O., Sept. 12.—Considerable more coal is coming into the district, resulting in both Youngstown Sheet & Tube Co. and Republic Iron & Steel Co. putting all their by-product coke ovens into blast. Open-hearth activity among the independents is more pronounced and independent sheet mills are operating almost at capacity.

The most important gain in works activities is scored by the open-hearth departments, operating today at 84.5 per cent, compared with 76.5 per cent a week ago, and 56 per cent two weeks ago. Brier Hill Steel Co. and Youngstown Sheet & Tube Co. each has 10 furnaces active out of 12; Republic Iron & Steel Co., 12 out of 14, Trumbull Steel Co. six out of seven, and Sharon Steel Hoop Co. five out of six.

Sheet mills are operating at 86.5 per cent, compared with 83.7 per cent a week ago and 82 per cent two weeks ago. Brier Hill Steel Co. is operating its 28 mills, Republic Iron & Steel Co. 16 out of 18, Newton Steel Co. 10, Trumbull Steel Co. six out of 15, Sharon Steel Hoop Co. nine, Falcon Steel Co. and Mahoning Valley Steel Co. eight each.

Active blast furnace capacity is being increased, Youngstown Sheet & Tube Co. having just lighted its fourth stack at East Youngstown and Republic Iron & Steel Co. its third stack at Haselton. Brier Hill Steel Co. is blowing its second stack and soon may relight its third. Republic company also may blow in another stack. Trumbull-Cliffs stack at Warren will resume blowing Thursday. The Carnegie Steel Co. continues to blow five stacks at Ohio works and four at New Castle, Pa.

Chicago Blast Furnace Operation Enlarged

Chicago, Sept. 12.—Production of pig iron has been resumed by three banked blast furnace stacks of the Illinois Steel Co., bringing ingot production from 50 to 60 per cent of capacity. Two stacks have been put in blast at Gary and one at South Chicago, a total of seven now being active at Gary, four at South Works, and one at Joliet representing 45 per cent of furnace capacity. Inland Steel Co. continues at about 65 per cent.

Relight Three Furnaces

Cleveland, Sept. 12.—The Cleveland furnace of the Otis Steel Co., and the 700-ton stack of the Trumbull-Cliffs Furnace Co., are to be blown in this week. The Trumbull furnace is to start on basic for the Trumbull Steel Co. Another lake furnace has been blown in. A third interest is preparing to relight two furnaces in the near future.

Senate Rates

On Iron and Steel Accepted by House Conferees—Tariff Passage Soon

Washington, Sept. 12.—The tariff bill as reported back today by the senate and house conference reveals practically no change in the iron and steel rates as adopted by the senate. The house conferees agreed to all but four of 254 amendments in the rates and classifications made by the senate, this being due partially to the fact the senate rates were written on the basis of foreign valuation.

Ferromanganese remains dutiable at 1⅞ cents per pound with an additional 15 per cent where carbon is under 1 per cent. The dividing line between ferromanganese and spiegeleisen stays at 30 per cent. The pig iron and spiegeleisen rate is 75 cents a ton and scrap iron and steel also 75 cents a ton when the value is not over 7 cents a pound. Scrap tin plate is on the free list. Manganese ore is dutiable at 1 cent a pound and tungsten ore at 45 cents a pound. Both houses already are in agreement on these rates. The senate rate of 35 cents on molybdenum ore is retained. Ferromolybdenum is dutiable at 50 cents a pound plus 15 per cent; ferrotungsten at 60 cents a pound plus 25 per cent; ferrosilicon, 8 to 60 per cent, 2 cents a pound; 60 to 80 per cent, 3 cents; 80 to 90 per cent, 4 cents and over 90 per cent, 8 cents a pound. The conferees also agreed to the senate protection on high speed steel which provides an additional cumulative duty of 65 cents a pound for molybdenum and 72 cents a pound for tungsten when the alloy content in each case exceeds 6/10 of one per cent. The house conferees agreed to the new senate paragraph levying 60 per cent on high-speed steel tools compared with 35 per cent originally fixed by the house. The senate rate of $5.60 a ton on fluorspar was accepted. Crude magnesite remains at the senate's 5/16 cent a pound but the conference increased the dead burned to 23/40 cent a pound more.

Slight changes were made on the rates on chain. The duty on machine tools was increased to 30 per cent. The rates stand on structural steel at 1/5 cent a pound; on tin and terne plate, 1 cent a pound, and on wood screws, 25 per cent. Other articles remaining at the senate rates include black sheets, boiler plate, ingots, blooms and slabs, muck bars, bar iron, hoops and bands, wire rods, wire, cast iron pipe, nails, rivets, galvanized sheets and rails.

Display Steel Works Equipment

Eighty Manufacturers Participate in Exhibition of Electrical Apparatus, Material Handling Machinery and Miscellaneous Supplies at Cleveland Convention of Association of Iron and Steel Electrical Engineers—Hold Technical Sessions

ELECTRICAL apparatus for steel plant use, control and wiring fixtures, material handling equipment, meters and recording instruments for fluids and gases, stoker and boiler appliances, and miscellaneous abrasive, lubricating, packing and tool room supplies are displayed this week in the basement exhibition hall of Cleveland's new public auditorium as part of the sixteenth annual convention of the Association of Iron and Steel Electrical Engineers. Not only is the exhibition the most pretentious yet attempted by the association, but it brings together an unusually large number of manufacturers identified with the technical advancement of equipment designed for electrical installations in steel mills. The displays truly reflect the development of this phase of the industry.

More than half of the 80 exhibits involve purely electrical devices; about a third include material handling equipment such as cranes, hoists and trucks; and the remainder are devoted to a diversity of appliances used principally in connection with the apparatus named in the first two classifications.

Business and technical sessions are being held concurrently with the exhibition. The opening session held Monday was devoted to the transaction of business and election of officers. More than half a dozen committee reports, dealing with standardization, practice and other problems, were presented.

With association and committee reports disposed of, the members of the organization on Tuesday settled down to a program of technical papers. Professional sessions were scheduled for morning and afternoon of Tuesday, Wednesday and Thursday, and Friday morning.

A notable feature of the convention is evidence of progress in standardization found in committee reports and technical papers. The proposed crane code aroused much interest.

Exhibits of Mill Apparatus Reflect Advancement

PROBABLY two-thirds of the exhibits comprised electrical equipment, including motors, control equipment, welding outfits, lights, fuses, cables, insulating materials, etc.

Displayed by the General Electric Co., Schenectady, N. Y., in operation was a semiautomatic arc welding equipment and a reversing type mill crane motor with solenoid brake. Industrial control apparatus also was shown. A 40-ton storage battery locomotive was demonstrated daily on the lake front.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., showed a cold roll mill panel, an arc welding apparatus in operation, an electric furnace electrode control, an automatic boiler pressure regulator, electric heat treating furnaces, a portable air compressor unit for blowing out armatures, motors, automatic starters and starting switches. Cutler-Hammer Mfg. Co., Milwaukee, displayed in operation a 60-inch magnetic clutch driven by a motor controlled by a standard steel mill control panel. Arranged attractively in the rear of the booth were specimens and photographs of controllers, heating units, magnets, meters, etc., made by that company.

A stoker motor drive with automatic control and a new type industrial motor having ball bearings and featuring a solid piece squirrel cage motor with the ends silver soldered was exhibited by the Louis Allis Co., Milwaukee. The Crocker-Wheeler Co., Ampere, N. J., displayed industrial motors and emphasized the construction of brush holders, coils, bearings and motors. A general line of motors both alternating and direct current was shown by the Reliance Electric Engineering Co., Cleveland, with an adjustable speed motor and a mill type motor being featured.

Motors and Controllers Shown

Two motors of 5 and 7½ horsepower respectively for general industrial use together with a complete line of single and double direct-current contactors, an automatic compensator, across the line starting switch, a large lifting magnet, a full automatic reversing board, dinky controllers and a crane limit stop composed the display of the Electric Controller & Mfg. Co., Cleveland. The booth of the Allis-Chalmers Mfg. Co., Milwaukee, was fitted up as a rest room where photographs of steel mill electrical equipment were shown.

Various types of control equipment was given prominence. The Ohio Electric & Controller Co., Cleveland, at its booth demonstrated a control for an electromagnet. Fractional horsepower motors were shown also. Switchboard meters both indicating and recording and motors and control apparatus composed the exhibit of Ludwig Hommel & Co., Pittsburgh. The Cutter Electric & Mfg. Co., Philadelphia, showed a 6000-ampere motor operated by a remote control circuit breaker, a 3-phase, 1000-ampere nonclosable overload time limit circuit breaker, and circuit breakers for individual installations.

Safety switches, switchboards and panel boards were displayed by Schweitzer & Conrad, Inc., Chicago. Various types of safety switches for motor control were shown at the booth of the Square D Co., Detroit. A full line of controllers, both automatic and manual, also several types of motors were shown by the Industrial Controller Co., Milwaukee. The Trumbull-Vanderpoel Electric Mfg. Co., Plainville, Conn., had a complete line of safety switches and motor starters at its booth.

Allen-Bradley Co., Milwaukee, demonstrated a mill type controller, a 3-circuit battery charging panel, an

automatic squirrel cage motor starter, a hand operated squirrel cage motor starter, a full automatic crane controller and an across-the-line switch. W. A. McCombs & Co., Pittsburgh, showed switchboard and portable type instruments, mill service and switchboard type circuit breakers, safety inclosed circuit breakers, mill service underground pot heads, both disconnecting and nondisconnecting types, and underground junction boxes. Circuit breakers, an automatic motor starter, and an arcless drum controller equipment made up the display of the Automatic Reclosing Circuit Breaker Co., Columbus, O. A cabinet type reversing motor control panel was shown by the Rowan Controller Co., Baltimore.

That industrial lighting is an important subject was illustrated by the number of illumination displays. The Ivanhoe Regent Works of the General Electric Co., Cleveland, displayed industrial lighting equipment, featuring various types of reflectors and new holding devices for indoor and outdoor use. Units for mill and factory offices and drafting rooms also were displayed. The Thompson Electric Co., Cleveland, exhibited lighting fixtures and a disconnecting type hanger to facilitate cleaning. Photographs of typical installations were on exhibit. Various types of lighting fixtures, outlets, plugs and receptacles composed the display of Russel & Stoll Co., New York. A feature of the exhibit of the Appleton Electric Co., Chicago, was a lighting fixture containing a reel so that the light could be placed at any desired height. Other equipment at this booth consisted of plugs, outlets, junction boxes and conduit fittings. Differences between incorrect and correct illumination, effect of glare, etc., was demonstrated by the National Lamp Works of the General Electric Co., Cleveland. A special device also demonstrated the extreme ruggedness of mill-type incandescent lamp filaments.

Many Lighting Units Displayed

The Benjamin Electric Mfg. Co., Chicago, showed a variety of industrial lighting fixtures, also a complete line of sockets, plugs, outlets and similar equipment. Lighting equipment for mills and factory offices, as well as interoffice telephones, yard flood lights and safety switches composed the exhibit of the Western Electric Co., Chicago. The V. V. Fittings Co., Philadelphia, also had a line of lighting fixtures, also conduit fittings, fuse boxes, and safety switches. Erner Electric Co., Cleveland, showed a display of lighting units, including disconnecting types, together with electric soldering irons and insulator fittings.

Surge lighting arresters with a compensated spark gap were shown at the booth of the Electro Service Co., Marietta, Ga., a miniature set demonstrating its operation. Bus bar supports, both indoor and outdoor, lighting arresters, insulators, disconnecting switches, air break switches, high tension fuses, and heavy duty plugs and receptacles composed the display of the Delta Star Electric Co., Chicago. Schweitzer & Conrad, Inc., Chicago, showed lightning arresters, featuring a double-throw air break switch. Other equipment consisted of bus supports, switches, fuse blocks, high voltage detectors and liquid type fuses up to 110,000 volts 400 amperes.

A most extensive line of bus bar apparatus, insulators and disconnecting switches made up the exhibit of the Electric Power Equipment Corp., Philadelphia. The Efficiency Electric Co., East Palestine, O., showed a number of industrial wiring devices and safety switches.

Among the companies displaying fuses were: The Bussman Mfg. Co., St. Louis, which showed fuses for all classes of service; Economy Fuse & Mfg. Co., Chicago, which showed both renewable and nonrenewable types; Chicago Fuse Co., Chicago, which showed a wide line of fuses as well as outlet boxes and conduit fittings. Various types of conduit fixtures, conduit outlets and cable fixtures were displayed by Crouse-Hinds Co., Syracuse, N. Y.

Much Miscellaneous Equipment

Specimens of cable for all purposes, cable pot heads and accessories were on exhibit at the booth of the Standard Underground Cable Co., Pittsburgh. The Chicago Mica Co., Valparaiso, Ind., displayed mica and insulating material for all kinds of industrial use. Asbestos insulated wire and and magnet wire together with a number of photographs composed the exhibit of H. Lee Reynolds Co., Pittsburgh. Commutator stones, insulating varnishes and beads, commutator grinding and slotting tools were shown by the Martindale Electric Co., Cleveland.

A new development in 3-phase transformer design with photographs of installations were on display by the Pittsburgh Transformer Co., Pittsburgh. A machine for spreading armature coils and a machine for winding loops and field coils were in operation at the booth of the Mutual Foundry & Machine Co., Atlanta, Ga. A portable plastic arc welding equipment was on display at the booth of the Wilson Welder & Metals Co., New York. Welding demonstrations were made in specially constructed booths.

Motor and generator commutators made up the display of the Homer Commutator Co., Cleveland. This company featured the type of construction which it uses. Storage batteries for industrial use were featured by the Electric Storage Battery Co., Philadelphia, dissembled batteries being shown to illustrate the type of cell construction.

Display Handling Equipment

Material handling equipment was exhibited by a dozen manufacturers. Five interesting models of steelworks cranes were shown by the Alliance Machine Co., Alliance, O. Miniatures of the interlocking gear and interlocking drum types of 175-ton ladle cranes, of an ingot stripper and soaking pit trolley and of a forge manipulator were demonstrated. The models were about 1/16 of actual size, and with the exception of the manipulator, were composed of castings and forgings conforming in design to the parts of the full-sized machines.

Electric monorail hoists played an important part in the exhibition. A hoist designed for handling coiled wire was shown in actual operation by the Cleveland Crane & Engineering Co., Wickliffe, O. A crane motor and brake also were exhibited. The Euclid Crane & Hoist Co., Cleveland, demonstrated a 3-ton electric monorail hoist and its subsidiary company, Armitage Bros., showed a handpower 1-ton monorail hoist in operation. Parts of these hoists also were exhibited. Electric hoists of one-half and one ton capacity operating on a monorail system were demonstrated by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

Trucks, trailers and cranes were the features of the exhibits of the Atlas Car & Mfg. Co., Baker R. & L. Co., Elwell-Parker Electric Co., and Lakewood Engineering Co., of Cleveland and the Mercury Mfg. Co., of Chicago. In addition to its storage battery lift truck and tractor, the Baker company demonstrated a 4-motor crane having a capacity of 3000 pounds at a radius of 7 feet. All movements are controlled by push buttons. The Elwell-Parker company exhibit included a storage battery lift truck, tractor and a two-motor crane having a capacity of 3000 pounds at 6 feet radius. The Lakewood company displayed a 4-wheel steer and drive, storage battery tractor and a 76-inch battery tier lift truck of 2-ton capacity. The Mercury

company demonstrated a storage battery tractor, and a trailer and displayed moving pictures of typical installations. An industrial tractor was demonstrated by the Atlas Car & Mfg. Co.

An interesting working model of a coal handling plant was shown by the R. H. Beaumont Co., Philadelphia. A steel bunker, skip hoist, screens, crushers, etc., were included in the miniature installation. Orange-peel, clam shell and other types of material handling buckets were exhibited by the Hayward Co., New York. The Lakewood Engineering Co. also exhibited a clam shell bucket.

Wide Range of Meters Shown

The importance of meters, pyrometers and recording instruments in power plant operation was reflected in the number of companies exhibiting these products. Meters for measuring the volume of gases and fluids, together with recording apparatus, were demonstrated by the Republic Flow Meters Co., Chicago. The Leeds & Northrup Co., Philadelphia, and the Taylor Instrument Co.'s Rochester, exhibited pyrometers and recording devices, while the Bailey Meter Co., Cleveland, displayed meters for gas, steam flow and boilers. A tachometer also was exhibited.

Other power plant equipment, including boilers, stokers, blowers, pumps, packing, etc., was shown by several exhibitors. A direct-geared, motor-driven pump for hydraulic pressure service was exhibited by the Aldrich Pump Co., Allentown, Pa. An air cooling installation, including a fan and motor, exhaustor and washer, was operated by the American Blower Co., Detroit. A new unit-type air filter for turbo-generators, mill motors, pneumatic lines, etc., was displayed by the Midwest Steel & Supply Co., New York. The filter unit consists of a square metal frame containing small copper-plated steel ferrules. The front and back of the frame are of expanded metal, and the air, passing through the mass of small cylinders is subject to frequent changes of direction. The units may be inserted in sheet metal frames designed for any multiple of units to suit local conditions. Filters for high pressure air also were exhibited.

The Green Engineering Co., East Chicago, Ind., showed a model of a stoker and exhibited drawings and illustrations of installations. The D. Connelly Boiler Co., Cleveland, demonstrated a small boiler model illustrating the circulation of water in the boiler manufactured by that company. Packing for practically all power plant purposes was displayed by the Crane Packing Co., Chicago.

Helical gears for use in steel mills were shown by the R. D. Nuttall Co., Pittsburgh. The qualities of heat treated gears was emphasized in this exhibit. A complete line of gears and pinions was shown by the Tool Steel Gear & Pinion Co., Cincinnati. Cut sections of gears were displayed to indicate the character of the metal in the teeth imparted by special heat treatment.

Bearings Attract Attention

A demonstration of the accuracy of a ball bearing attracted visitors to the booth of the S. K. F. Industries, New York, where ball and roller bearings were exhibited. The Norma Co. of America, Long Island City, New York, showed a complete line of roller, ball and thrust bearings, the feature being a self-aligning roller bearing designed for heavy duty. The bearings are incased in a ring having a spherical periphery, permitting it to adjust itself to the alignment of the shaft.

Electric hand tools, including drills, reamers, grinders, etc., were displayed by the Van Dorn Electric Tool Co., Cleveland, and the Chicago Pneumatic Tool Co., New York. A number of bench grinders were shown by the first named company.

A miniature electric furnace was one of the features of the exhibit of the National Carbon Co., Cleveland. Sections of carbon electrodes ranging in size from 6 to 24 inches in diameter, were shown by this exhibitor.

Lubricants were displayed by the Keystone Lubricating Co., Philadelphia, and the United States Graphite Co., Saginaw, Mich. The last named company also showed motor and generator brushes. Roofing, insulation, high temperature cement, asbestos products, and a method of underfloor wiring were among the features of the exhibit of H. W. Johns-Manville Co., New York.

Steel shelving capable of being erected in a wide range of shapes and sizes was shown by the E. F. Hauserman Co. Cleveland. The units are drilled to accommodate shelves and partitions spaced at any multiple of 3 inches. Office doors and partitions, skylights, etc., were other steel building materials shown by the company.

The American Steel & Wire Co., Cleveland exhibited a great variety of wire products including bare and covered wire, cable, rail bonds, etc. The American Heat Economy bureau demonstrated a heating device. Floor treads designed to prevent slipping were shown by the American Abrasive Metals Co. New York. The Thermoid Rubber So., Trenton, N. J., exhibited clutch rings, brake lining, universal joint disks, etc., for heavy machinery.

Scrap Prices Go Higher

(*Continued from Page* 694)

ing scrap freely to offset high prices in pig iron. Quotations are unchanged.

Has Runaway Tendency

Philadelphia, Sept. 12.—Scrap is developing a runaway tendency. Practically all prices are up $1 or more. Good general buying features the past week but only a few large tonnages were sold due to the dealers refusing to sell much and holding for higher prices. One large steelmaker wanted a large tonnage of steel scrap at $16.50 and $17 delivered, but dealers refuse to accept it. Most eastern works now would buy steel scrap at $16.50 but dealers generally regard $18 as the minimum they would take.

Prices Advanced Sharply

Cleveland, Sept. 12.—Sharp advances in iron and steel scrap prices have been made during the past week. The advancing pig iron market, scarcity of cars and transportation difficulties are responsible for the increases which have extended throughout the list. New buying is not heavy although the Mahoning valley is taking some tonnage in addition to that applying on old contracts. This embraces heavy melting steel and hydraulic compressed sheets. Contract tonnage also is being taken without reservation by some northern Ohio consumers. Heavy melting steel in Cleveland has advanced from $16 and $16.50 to $17.75 and $18.25 machine shop turnings from $11.75 and $12 to $13.25 and $13.75s cast iron borings from $12 and $12.50 to $14 and $14.25 mixed borings and turnings from $12 and $12.25 to $13.75 and $14; hydraulic compressed sheets from $13 and to $13.25 to $15.75 and $16; No. 1 cast from $17 and $17.50 to $20 and $21. Heavy melting steel in the valley is up from $17.50 and $17.75 to $19.50 and $20.50; machine shop turnings from $12 and $12.50 to $13.50 and $14; cast iron borings from $14.25 and $14.75 to $15.25 and $15.75; hydralic compressed sheets from $15 and $15.50 to $17.25 and $17.50; and No. 1 cast from $18 and $18.50 to $20.50 and $21.

Quotations Up Further

Chicago, Sept. 12.—In a brokers' market, quotations on scrap are advancing steadily and have reached an unusually high level in practically all grades. A veritable famine exists in railroad specialties, such as knuckles, couplers, springs and wheels, and it is almost impossible to buy tonnages of these materials. Consumers whose practice is built up entirely on the use of these supplies find much difficulty in substituting other grades. Brokers with short orders are losing money on every ton they supply their customers, and as a result it is almost impossible to buy future tonnages, even at the present higher level, as dealers believe demand will cause an even further rise. Heavy melting steel is quoted at $18.50 to $19, in the Chicago market, and $18.50 has been paid by a consumer, while dealers with short contracts have paid the higher figure. Demand for cast and lists are infrequent. The Chicago Great Western is offering 500 tons.

Western Building Active

Permits for New Construction Reaches Peak—Plate Sales Are Sizable with Considerable Tonnage in View—Scrap Shortage Noticed

SAN FRANCISCO, Sept.9.—Business conditions throughout California continue to improve. Construction activity is increasing as is evidenced by building permits issued in San Francisco during August, which numbered 690 with a total estimated value of $6,214,-082. This total is greater than has been attained before during normal operations. Only during the rehabilitation period following the fire of 1906 and during January 1914 when permits for over $6,000,000 of Panama-Pacific international exposition buildings were issued, has the August total been exceed. Reports from Los Angeles state that an $11,000,000 total is expected as up to Aug. 28, 3969 permits had been issued with a valuation of $10,646,952.

Pig Iron and Coke

Little change is noted in the pig iron and coke market. Foundry activity has shown no improvement and foundries report supplies of coke and iron on hand sufficient for present demand. The Southern Pacific has an inquiry out for 300 tons of No. 2 foundry. An interest in Los Angeles has purchased 400 tons of Belgian iron at $22 c. i. f. San Pedro and is seeking another 600 ton lot.

Bars, Plates and Shapes

Bar mill operators report reinforcing bar business coming in at a better rate than merchant bar material. No change has occurred in open-hearth operations, six out of 12 operating. The only award of any size reported this week was the filtration plant for Sacramento, which involved, 870 tons of bars. Matthews Construction Co., secured the general contract and the steel has not yet been placed.

On hoops and bands 2.75c base Pittsburgh is the minimum in this district and 3.00c is being asked for the smaller sizes. Demand is only fair.

Demand for bolts, nuts and rivets, continues favorable. Little railroad buying has occurred of late. One interest announced new prices on boiler and structural rivets, effective Sept. 5 as follows, structural 3.00c and boiler 3.10c base Pittsburgh. Large and small machine bolts, cut thread, are quoted at 60-10 off while small machine bolts, rolled thread, are quoted at 60-10-10 off.

Plates are moving well and a considerable tonnage is in sight. The prevailing price on plates ranges from 2.45c to 2.50c base c. i. f. San Francisco as a minimum to 3.00c, one lot of a 1000 tons going to a Los Angeles interest at 2.45c San Pedro. The price is maintained 2.95c San Francisco on out-of-stock shipments. The Steel Tank & Pipe Co. secured two 55,000-barrel tanks for the Associated Oil Co. involving approximately 400 tons. The Los Angeles Shipbuilding & Dry Dock Co. were low bidders on some steel for the Associated Oil Co. involving 250 tons.

Recent lettings of structural steel have been mostly for moderate tonnages. Minimum prices on plain shapes range from 2.45c to 2.50c base c. i. f. San Francisco.

Other Finished Material

The tendency in sheets is toward higher levels and the market is strengthening. In blue annealed, 2.50c base Pittsburgh is general with at least one company quoting 2.45c. For 2 to 3 weeks shipment, 2.60c base is being secured by an independent interest. No outstanding tonnages have been reported. Most independents are quoting 4.50c base on galvanized and several 4.60c.

Practically no stocks of standard pipe are on the coast and consumers are seeking deliveries on old contracts. Oil country goods continue active although production of crude oil has been curtailed considerably. Operations reported for the week ending Sept. 2 show 29 new wells started compared with 22 the previous week. Total to date this year is 933 as compared with 990 the same date last year. Deepening or retrilling jobs numbered 10 as compared with 8 the preceeding week. Total to date this year 559; total to same date last year 525.

Demand for cast iron pipe from private sources is fairly good. The National Cast Iron Pipe Co. was awarded 2940 tons of 4-inch for Los Angeles.

Warehouse Market

No change has occurred in prices of out-of-stock material despite demand being in excess of a year ago and that mill prices are advancing. Nails, pipe and sheets are most active. In Los Angeles boiler and structural rivets have been advanced from 4.55c and 4.45c to 4.80c and 4.70c respectively and machine bolts large and small are being quoted at 40-5 off and 45 off respectively.

Old Material

A shortage in both cast iron scrap and melting steel is reported, though demand is not keen. Melting steel is now bringing $11.50 a ton delivered and cast scrap $26 a ton delivered.

Merger of Pacific Coast Mills Being Promoted

Seattle, Sept. 8.—That negotiations are under way to merge iron, coal and steel interests that will include the Pacific Coast Steel Co.'s properties in Seattle and other coast cities has been disclosed, but whether these plans will materialize is doubted by William Pigott, of Seattle, vice president of the Pacific Coast Steel Co. who has been summoned to a conference in San Francisco to discuss the plan. The plans under tentative discussion call for the organization of a $20,000,-000 corporation to be known as the Pacific Steel Corp. to take over the coal and iron deposits of the Milner interests in Utah and also to merge all steel mills, including the local plant, now operating on the Pacific coast.

In expressing doubt as to the probability of the plans coming to fruition, Mr. Pigott issued the following statement:

"For several months there have been discussions and conversations between Pacific Coast mills and promoters regarding the possibility of merging Pacific Coast properties and while it is reported in press dispatches that a $20,000,000 corporation has been formed under the laws of Delaware by some of my associates in San Francisco, I have nothing in the way of reliable information on the subject. It is my opinion, however, that up to the present time there is nothing tangible, simply a company on paper.

"While I believe in time blast furnaces will be erected at Salt Lake, Utah, where the only commercial bodies of iron ore and coking coal are to be found tributary to the Pacific coast, and that when pig iron is made there it will mean much to the coast cities, including Seattle, still I am not convinced that the promotions now going on at San Francisco or the plans outlined now will materialize. I am going to San Francisco to see what foundation there is for the reports in the press but not for the purpose of exchanging my present holdings for stock in a $20,-000,000 promotion scheme or corporation."

Press dispatches concerning the proposed consolidation quote T. T. Gregory of San Francisco, attorney for the enterprise, that the new corporation would take over all the properties of the Pacific Coast Steel Co., the Los Angeles plant of the Southern California Iron & Steel Co. and other West Coast mills together with the Milner iron and coal deposits in Utah. One of the first steps to follow the completion of the combination was the erection of a blast furnace plant in Utah, Mr. Gregory stated.

Accident Rate Declines

Washington, Sept. 12.—Results of an investigation that covered the years 1910-19 in general and 1910-14 in detail are set forth in the publication of a bulletin, "Causes and Prevention of Accidents in the Iron and Steel Industry, 1910-19," by the bureau of labor statistics of the department of labor. The bulletin shows that in 1920, when the industry included 442,-685 workers, there were 50,893 accident cases, compared with 42,276 in 1919, when employes totaled 377,549, and 45,283 cases in 1910, when employes numbered 202,157. Per 1,000,-000 hours of exposure, the frequency rate for 1920 was 38.3, for 1919 it was 41.6, and for 1910 it was 74.7.

British Pig Iron Is Advanced

American Demand Clearing Away Stocks and Stimulating Market—5000 Tons Dispatched to Baltimore—Steel Prices Continue Downward—Tin Plate Plants May Suspend, Due to Collapse in Currency Rates

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

Sterling—$4.46

LONDON, Sept. 11.—American demand for pig iron has cleared away stocks of foundry iron in England and has stimulated prices. Cleveland and Scotch irons have been advanced 2 shillings 6 pence ($0.55). Middlesbrough No. 3 is now £3 4s 10d ($14.45), while Scotch foundry iron No. 3 is £4 17s 6d ($21.74). Several furnaces are being relighted. A cargo of 5000 tons of pig iron is being dispatched this week from the Barrow-in-Furness district to Baltimore.

Sentiment in the British steel market is more hopeful, the works are busier and prices are being cut in a continuation of keen competition. Belgian semifinished steel which has been offered at low figures is now underquoted by British makers 7 shillings 6 pence ($1.67). British billets and sheet bars are £6 5s ($27.87). British and Scotch steel bars and ship plates are £8 7s 6d ($37.24) and for export they are £8 ($35.68). A floating dock at Southampton will require 16,000 tons of steel. Rail orders are improving, especially those from India and Australia, it is reported.

The price of galvanized sheets has been increased again, the quotation now being £16 12s 6d ($74.14). The collapse of European currency rates has checked the tin plate trade and suspension of some mill operations is being considered

Shipments of coal from Cardiff to the United States last week amount to 186,000 tons. Since July, 190 vessels have been chartered. to carry 1,400,000 tons of coal to the United States.

German steel production is decreasing due to lack of fuel and other materials.

American Purchases Features European Trade

European Staff Special

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling $4.47

BIRMINGHAM, Eng., Sept. 1.—Makers of iron and steel are inclined to be pessimistic over the slow recovery, although nobody seems to have any doubt that before long a fair trade will be in progress. Consumers are keeping back their orders, relying on the present keen competition to bring prices to a lower level. Since the recent decontrol of prices makers are cutting severely to get business. English billets a week ago were £7 10s ($33.52) but now are £7 5s ($32.40). Orders have been accepted at £7 ($31.29).

Competition from the continent is aided by the fall in the exchanges. As the Belgian franc is now down to 60 per pound sterling another attempt is being made to get Belgian steel into the English market. An offer received in Birmingham quotes Belgian joists at £6 15s 6d ($30.27) f.o.b. Antwerp, the lowest price yet received. To this would have to be added £1 7s 6d ($6.14), making a delivered price of £8 3s ($36.42) against the British figure of £9 ($40.23). Latest reports from Belgium fully confirm the news already reported in THE IRON TRADE REVIEW of large buying by Germany. British manufacturers have concluded that Germany is out of competition for a long time.

The effect of the holidays is still apparent and makes a diagnosis of the state of business a little difficult. There are encouraging features which lead to the expectation of an improvement in the autumn. The Lancashire area is very decided on this point. Lancashire has the advantage of a textile boom. Special inquiries recently made by constructional engineers encourage the belief that a great deal of work will be done. Considerable work has been placed.

The Staffordshire ironworks continue to show a little more activity. The reopening of certain shipyards has brought some business to the chain trade, and warehouses are restocking with iron bars and similar products. One mill has restarted after 18 months' idleness. There are prophecies of a short run, and it is well known that iron cannot now be made at a profit. On this point all ironmasters seem to be agreed, and some makers of finished material assert they are running their mills merely to find employment for their men and to prevent old customers from going elsewhere. Prices have weakened a little, but certain makers decline to go below £11 ($49.17).

Conditions in the pig iron industry are increasingly difficult. The trade is suffering severely from the collapse in the European exchanges which for the time being has nearly caused a suspension of business with Germany, France and Belgium. There are signs that American business will be a feature for some time. A certain amount of American buying is normal. Some foundries on the Pacific coast regularly have been taking British pig iron. A firm in Seattle is reported to have purchased a large tonnage of scrap pig iron at $28.75 per ton, c.i.f. Seattle. This is said to be a good competitive rate with American houses. The information here is that the ocean freight rate from England to the Pacific coast is lower than the rate from the Atlantic coast of the United States to the Pacific. As pig iron is on the American free list makers here hope to carry on a moderate business with America. Belgium is understood to be sending large quantities of pig iron to the Pacific coast. An authority specially well informed has told THE IRON TRADE REVIEW correspondent of a recent contract for 10,000 tons of Belgian pig iron to be delivered to San Francisco at $24. The freight rate from Antwerp to the Pacific is $3.25 per ton. Against this the best rate from the Atlantic coast to the Pacific coast, according to this informant is £7 ($31.29) per ton. Sixty-pound section rails also are reported to have been purchased from Belgium for delivery on the Pacific coast.

The general belief in Cleveland is that prices will have to be reduced further before pig iron is sold in large quantities. At present continental pig iron can be landed in the Tees at £4 5s ($18.99) per ton c.i.f. The Cleveland makers do not expect to retain their trade with Scotland while this competition continues. At present they are saved from complete depression by the moderate American business and fair sales of hematite to South Wales. It is believed that Middlesbrough hematite is a shade firmer though there are still sales at £4 9s ($19.88) for export.

For some reason the northern makers of pig iron are not subject to the increases in coke prices which are adding to costs in the Midland districts. Large sales of coke to foreign buyers have led to a general advance of 2 shillings 6 pence ($0.56) per ton, add-

Current Iron and Steel Prices of Europe

British Market

Home Market Prices. Gross Tons at Works or Furnace.

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	27.88	6 5 0
Sheet bars	27.88	6 5 0
Wire rods	42.37	9 10 0
FINISHED STEEL		
Steel bars, England, ½ to 3-inch	37.35	8 7 6
Steel bars, England, ½ to 3-inch, for export	35.68	8 0 0
Plates, ship, bridge and tank, England	37.35	8 7 6
Plates, ship, bridge and tank, England, for export	35.68	8 0 0
Plates, ship, bridge and tank, Scotland	37.35	8 7 6
Plates, ship, bridge and tank, Scotland, for export	35.68	8 0 0
Beams, England	36.80	8 5 0
Beams, England, for export	35.68	8 0 0
Beams, Scotland	36.80	8 5 0
Beams, Scotland, for export	34.57	7 15 0
Sheets, black, 24 gage	47.39	10 12 6
Sheets, galvanized, 24 gage	74.15	16 12 6
Rails, 60 lbs. and over	35.68	8 0 0
Rails, 60 lbs. and over, for export	33.45	7 10 0
Tin plate, base box, 108 lbs	4.29	0 19 3
Steel hoops	45.72	10 5 0
Steel hoops, for export	44.60	10 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	19.62	4 8 0
Hematite, West Coast, Mixed Numbers	19.85	4 9 0
Basic, Middlesbrough	17.84	4 0 0
No. 3 Foundry, Middlesbrough	20.07	4 10 0
No. 3 Foundry, Derby, Leicester, Nottingham	18.40	4 2 6
No. 3 Foundry, Northamptonshire	17.28	3 17 6
No. 3 Foundry, Staffordshire	18.40	4 2 6
No. 3 Foundry, Scotch	21.74	4 17 6
Ferromanganese, 76 to 80 per cent	66.90	15 0 0
Ferromanganese, 76 to 80 per cent, for export	63.56	14 5 0
COKE		
Yorkshire furnace	4.35	0 19 6
Yorkshire foundry	6.13	1 7 6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	11.58	16,548
Foundry, No. 3, Oberhausen	9.50	13,567
Bessemer Stahleisen, Siegen	11.12	15,880
COKE		
Ruhr furnace	1.56	2230
Ruhr foundry	1.62	2315
SEMIFINISHED STEEL		
Billets	13.69	19,560
Sheet bars	14.56	20,800
Wire rods	14.20	20,280
FINISHED STEEL		
Standard rails	14.54	20,770
Merchant bars	16.84	24,050
Structural shapes	16.59	23,700
Ship plates	18.90	27,000
Medium plates, 3 to 5 millimeters	21.48	30,680
Sheets, below 3 millimeters	24.23	34,620
Tin plate	52.15	74,500
Plain wire	18.13	25,900
Bands and strips	19.15	27,360

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	24.16	315
Basic Bessemer, Lorraine	16.49	215
Foundry, Longwy, No. 3, sand-cast	15.72	205
Foundry, Longwy, No. 3, chill-cast	16.49	215
Ferromanganese, 76 to 80 per cent	72.48	945
COKE		
French furnace	7.29	95
German furnace, f.o.b. frontier	7.44	97
French foundry	10.74	140
SEMIFINISHED STEEL		
Blooms	24.54	320
Billets	26.08	340
Sheet bars	28.38	370
FINISHED STEEL		
Standard rails	42.19	550
Merchant bars	33.37	435
Angles	36.43	475
Normal beams and profiles	36.43	475
Plates, ship and tank, 10 millimeters and thicker	45.25	590
Plates, bridge and tank, 5 to 10 millimeters	49.09	640
Sheets, black, 3 millimeters	55.22	720
Sheets, blue annealed, 2 millimeters	69.03	900
Shafting, cold-drawn, 40 to 60 millimeters	65.20	850
Bars, 2 per cent nickel steel	84.37	1100

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	15.23	210
Basic open-hearth, Belgian	15.59	215
Gray forge, Belgian	14.86	205
Foundry, No. 3 Belgian	16.31	225
Foundry, No. 3, Luxemburg	16.31	225
Foundry, No. 3, Lorraine	15.59	215
SEMIFINISHED STEEL		
Blooms	22.84	315
Billets	24.65	340
Sheet bars	25.74	355
Wire rods	34.08	470
FINISHED MATERIAL		
Standard rails	29.73	410
Merchant bars	30.09	415
Normal beams and profiles	28.28	390
Plates, 5 millimeters and thicker	34.44	475
Sheets, black, 3 millimeters	35.89	495
Sheets, galvanized, 1 millimeter	96.06	1325
Plain wire	44.23	610
Galvanized wire	56.91	785
Wire nails	33.71	465

All prices are f.o.b. furnace or works.

ing about 3 shillings ($0.66) to 4 shillings ($0.77) per ton to fuel costs.

The galvanized sheet trade is maintaining its recent price advances with moderate success. The makers in the Midlands are asking £16 10s ($73.75) f.o.b. Liverpool, and increases are being secured in South Wales although the level there for shipment is slightly below the Midland figure.

The tin plate trade is passing through a period of dullness. Business with Canada has not maintained the encouraging level of the early part of the year. Canada took 26,239 tons of the tin plate during the first seven months compared with only 1091 in the same period last year. There are a few inquiries in the market from India, the Far East, the United States and Canada.

Franc Depreciation Aids French Exports

European Special Service

Office of THE IRON TRADE REVIEW,
224 Rue de Rivoli,

Franc—$0.075

PARIS, Sept. 1.—The situation of the French iron and steel market continues to improve. The demand for all classes of iron and steel products has been steadily increasing for several weeks. Buyers seem to have given up hope of lower prices. The recent fall in French exchange has not only strengthened the position of French producers in foreign markets but has also served to eliminate competition from the outside in the domestic market. The railroads and tramways are placing orders for long deferred requirements.

The Comptoir Siderurgique, the selling syndicate for rails and structual shapes, reports that rail sales for the month of August were far in excess of any other month this year. No change in price is anticipated. Large orders for track accessories have been placed. The Paris, Lyon, Mediterranean railroad has just ordered 4000 tons of

spikes and the Moroccan railroad and the department of public works of Tunis have also been buying heavily.

It is reported that the city of Shanghai has placed a large order for tramway rails with a French mill. A well known American exporting firm made strenuous efforts to obtain this business and probably would have done so but for the fact that the French financiers who came to the rescue of the Banque Industrielle de Chine, the backers of this tramway project, used their influence in favor of the French.

Increased production of pig iron has resulted in a brisk demand for ore and stocks are rapidly diminishing. The demand for export also has picked up, due to recent reductions in export freight rates. Average quotations are as follows: Briey, 15 francs ($1.13); Thionville, 11 francs ($0.83); Longwy-Nancy, 10 francs ($0.75) and 13 francs ($0.98); Pyrenees, 30 francs ($2.25), all f. o. b. mines.

Sales of foundry pig iron are increasing daily. It is becoming more and more difficult to place orders for chill-cast No. 3 at 215 francs ($16.15). Quotations on hematite vary from 250 francs ($18.75) to 270 francs ($20.25).

Makers of semifinished steel products have well filled order books. England continues to place orders with Lorraine mills and deliveries on new business range from three to six months. Prices are stiffening.

The present demand for plates and sheets exceeds production facilities. English and Belgian sheets, particularly the lighter gages, continue to find their way into France.

Belgian Export Market More Active

European Staff Special

BRUSSELS, Sept. 1.—Production of iron and steel is being increased in Belgium to meet the growing demand. The market has been improving slowly but surely for several weeks and the outlook is better. The export market has suddenly become very active. Orders for certain products, such as merchant bars, are in sufficient volume to allow a slight adjustment upward in price. Nearly all large producers are booked to capacity for September and October. The general opinion seems to be that prices of all classes of iron and steel products will soon be increased and the mills are not inclined to commit themselves for November, December delivery.

Franc—$0.07

Despite the fact that several additional blast furnaces have been blown in recently, pig iron producers find a ready market for their product and prices are easily maintained. English buyers have placed large orders in Belgium recently for phosphorus pig iron.

Semifinished steel products are in good demand and prices have again been increased. Premiums are being obtained for quick delivery. Competition from Lorraine mills has become less agressive.

Quotations on structural shapes and plates are higher. Mills have more unfilled tonnage on their books than at any time this year. Customers are clamoring for delivery on old orders.

Practically every attempt to reduce wages in the iron and steel industry has been resisted and serious strikes have ensued. Despite the fact that employers have met with a certain measure of success, the following table showing the scale of wages prevailing in 1914 as compared with 1922 is evidence that the problem remains unsolved:

	Francs per day	
	1914	1922
Unskilled labor	3.22 to 3.50	14.00 to 16.00
Lathe hands	4.50	23.50
Boilermakers	5.00	21.00
Rollers	5.00	30.00, plus bonus

German Exports Gain; Imports Less

European Special Service

LONDON, Sept. 1.—German exports of iron and steel products show slight increase. The total in June was 209,432 metric tons in May and 162,207 metric tons in June 1921, including scrap which forms but a negligible part of the total.

The exports of the three leading producers for the first six months of 1922, excluding scrap, and with Germany's figures converted to gross tons, are as follows:

	Great Britain	Germany	United States
Jan.	253,100	218,200	157,600
Feb.	223,400	170,000	133,200
March	295,800	208,700	204,800
April	258,400	195,500	190,100
May	272,400	204,500	218,500
June	236,300	209,132	208,700
Total, 6 mo.	1,539,400	1,206,032	1,112,900

The total German imports in June amounted to 215,022 metric tons, compared with 221,701 metric tons in May and 47,013 metric tons in June 1921. The present high imports partly are accounted for by the heavy purchase of scrap now being made by Germany. The total imports for the first half of 1922 were 910,797 metric tons, of which 238,694 metric tons represents scrap alone.

Among the principal items imported in June were 21,849 metric tons of pig iron; 75,162 tons of scrap; 27,224 tons of semifinished steel; 60,427 tons of bars; 5244 tons of plates, and 9637 tons of rails. Exports for the first six months are given in the accompanying table.

Asks Coronado Rehearing

Washington, Sept. 12.—Rehearing of the Coronado coal case, in which the Supreme Court ruled that labor unions are suable, has been asked by counsel for the Coronado Coal Co. The Supreme Court upheld the grounds upon which the company had obtained damages from the United Mine Workers in the lower courts but ordered the case remanded for further trial because of a lack of supporting evidence. The petition for rehearing affects only the damage phase of the case.

German Exports of Iron and Steel First Half 1922

In Metric Tons of 2205 Pounds

	Jan.	Feb.	March	April	May	June	Total
Pig iron, ferroalloys and scrap	23,064	14,804	24,830	19,992	11,714	11,813	105,217
Cast iron pipe	3,043	2,310	2,992	4,170	4,954	4,460	21,929
Rolls	1,997	847	2,076	898	540	475	6,833
Cast machine parts	667	632	722	601	360	294	3,276
Other castings	7,614	5,337	5,854	6,930	7,604	6,323	39,662
Blooms, billets, sheet bars	4,381	2,287	3,173	3,149	2,632	3,073	18,695
Bars and bands	55,638	40,751	42,877	37,435	40,787	34,387	251,875
Plates and sheets	24,184	16,478	17,687	17,737	22,927	20,075	119,088
Tin plate and galvanized sheets	2,614	2,135	2,937	2,335	2,357	1,180	14,558
Wire, rolled and drawn	11,059	12,797	11,267	12,225	12,431	16,103	75,882
Pipe	11,214	9,273	10,239	12,170	13,649	15,741	72,286
Rails and track fastenings	25,955	21,182	30,046	22,907	33,560	34,638	168,288
Wheels and tires	4,801	3,105	3,786	4,441	5,606	3,537	25,276
Forgings	10,544	8,641	11,843	11,427	8,341	14,172	64,968
Bridge and structural steel	4,116	4,150	5,462	5,348	4,181	5,367	28,624
Boilers	1,779	1,216	2,673	2,708	2,378	2,891	13,645
Anchors, hammers, etc.	674	364	522	543	472	481	3,056
Agricultural implements	3,331	2,498	3,406	3,551	3,277	2,890	18,953
Tools	3,416	2,839	3,435	3,701	3,351	3,392	20,134
Screws, bolts, nuts, etc.	2,948	2,424	3,119	3,021	2,612	2,710	16,834
Axles	246	190	258	389	312	327	1,722
Railway and auto springs	151	63	110	633	502	634	2,093
Wire rope	3,605	4,704	5,969	778	817	1,147	17,020
Other wire products	631	669	736	4,917	5,961	5,269	18,183
Wire nails	4,151	3,947	4,985	4,527	5,578	7,325	30,513
Hardware	3,425	2,765	3,879	4,199	3,633	3,343	21,244
Chain	622	572	2582	825	381	623	3,605
Miscellaneous	6,873	5,729	6,515	9,120	8,515	9,550	46,302
	221,743	172,709	211,980	200,677	209,432	213,220	1,229,761

State of Credit Gives Confidence

Long Period Of Deflation Puts Both Banks and Business Houses upon a Firm Financial Foundation—Federal Reserve System Strongest in Five Years—Industrial Activity Foreshadowed

BY JOHN W. HILL, FINANCIAL EDITOR

USUALLY the approach of fall, with its heavy demand upon credit for moving crops and merchandise, causes a stiffening of money rates. This year is proving an exception. As shown by the State of Credit chart in the BUSINESS TREND SECTION, interest rates continue low and cash ratio of the federal reserve system, the barometer of the nation's banking conditions, remains near the highest levels of the year.

This does not mean that there has been no expansion of trade activities; evidence of this is seen upon every hand, in the record of car loadings, in greatly increased production for scuh industries as iron and steel, building and automobiles compared with last year, and in the translation of widespread unemployment to labor shortages. What it does mean is that the long period of deflation with the liquidation of loans at banks and the writing down and working off of industrial inventories, have placed both banks and business in the pink of financial health.

Industry, like individuals, economizes and saves more in hard times than in good ones. As a result many business firms find themselves with considerable working capital. This has been further augmented by the recent innumerable refinancing and reorganizations of companies. By this means they have been enabled to pay off their current indebtedness and supply themselves with working cash. Even the farmers have paid off their loans, and where two years ago the reserve banks of the agriculture districts were borrowing heavily they are borrowing nothing at all today.

The cash ratio of the federal reserve system is now around 78 per cent against 66 per cent one year ago and slightly over 40 per cent two years ago. Rediscounts of the system of $405,000,000 compare with $1,508,000,000 one year before. They are now 86 per cent less than they were in the summer of 1920. Gold holdings of the system are over $3,000,000,000. This great reservoir of credit was never in better condition.

Manifestly business is financing a large share of its own needs. At the same time the commercial banks are in a position to handle a large expansion of requirements before they must resort to the federal reserve system for aid. Other conditions being favorable, ample and easy credit always stimulates trade activities. This picture of the nation's credit situation makes it plain that, with so many other factors of basic strength in evidence, business has room for a continued sound recovery and expansion running without serious interruption for many months. In 1919 the inflation and activity was begun upon the insecure foundation of unhealthy speculation and a credit situation already greatly depleted by the demands of the war.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One month ago	One year ago	1913
Business failures	329	376	402	285	300
Cash Ratio Fed. Res. system	78.3	79.6	80.4	66.8	.....
Loan rate, 4-6 months, N. Y. (per cent)	4	4	4	6	5½-6
Aver. 20 Ind'l shares	$97.86	$97.42	$93.19	$65.52	$81.13
Aver. 20 Rail shares	$92.70	$92.11	$89.38	$71.51	$106.15
Aver. 40 bonds	$82.34	$82.26	$81.50	$70.00	$93.00
Car loadings week ended Sept. 9)	890,000	856,219	859,733	815,147	900,000
Bank debits 165 cities (000 omitted)	$7,406,356	$7,244,176	$7,811,101	$6,253,203	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	Sept. 11 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.45	$4.47	$4.46	$3.73
Francs	19.3c	7.66c	7.83c	7.99c	7.43c
Lira	19.3c	4.31c	4.39c	4.57c	4.32c
Marks	23.8c	0.06⅞c	0.07¾c	0.11⅛c	0.99c

MONTHLY COMPARISON

	August	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$322,007,000	$350,081,000	$221,000,000	$71,450,000
Business failures: Number	1714	1753	1562	1336
Liabilities	$40,279,718	$40,101,313	$42,904,409	$22,723,000
Excess of exports	†$54,000,000	$74,000,000	$147,000,000	$54,406,000
Excess of gold imports	†$42,341,613	$11,367,882	$60,512,000	*$630,716
Bureau of Labor Price Index	†155	150	141	100
Bradstreet's Price Index	131	130.9	120.2	100
Economist's British Price Index	†4396	4389	4798	2717
Cost of Living Index	†155.6	155.4	163.1	100
New incorporations	†$634,259,200	$297,557,000	$281,759,000	$172,301,000
Railroad net earnings	$69,239,000	$76,000,000	$69,298,000	$59,900,000

†July. *Monthly average export excess.

The Business Trend

September 14, 1922

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Conspicuous improvement in the outlook results from rapid rise of coal production; industrial crisis passed and autumn activities beginning; continued advance of securities reflects easy money and forecasts period of good times.

INDUSTRIAL ACTIVITY—More blast furnaces resume; steel works operations ranging up to 80 per cent of capacity against around 50 per cent few weeks ago.

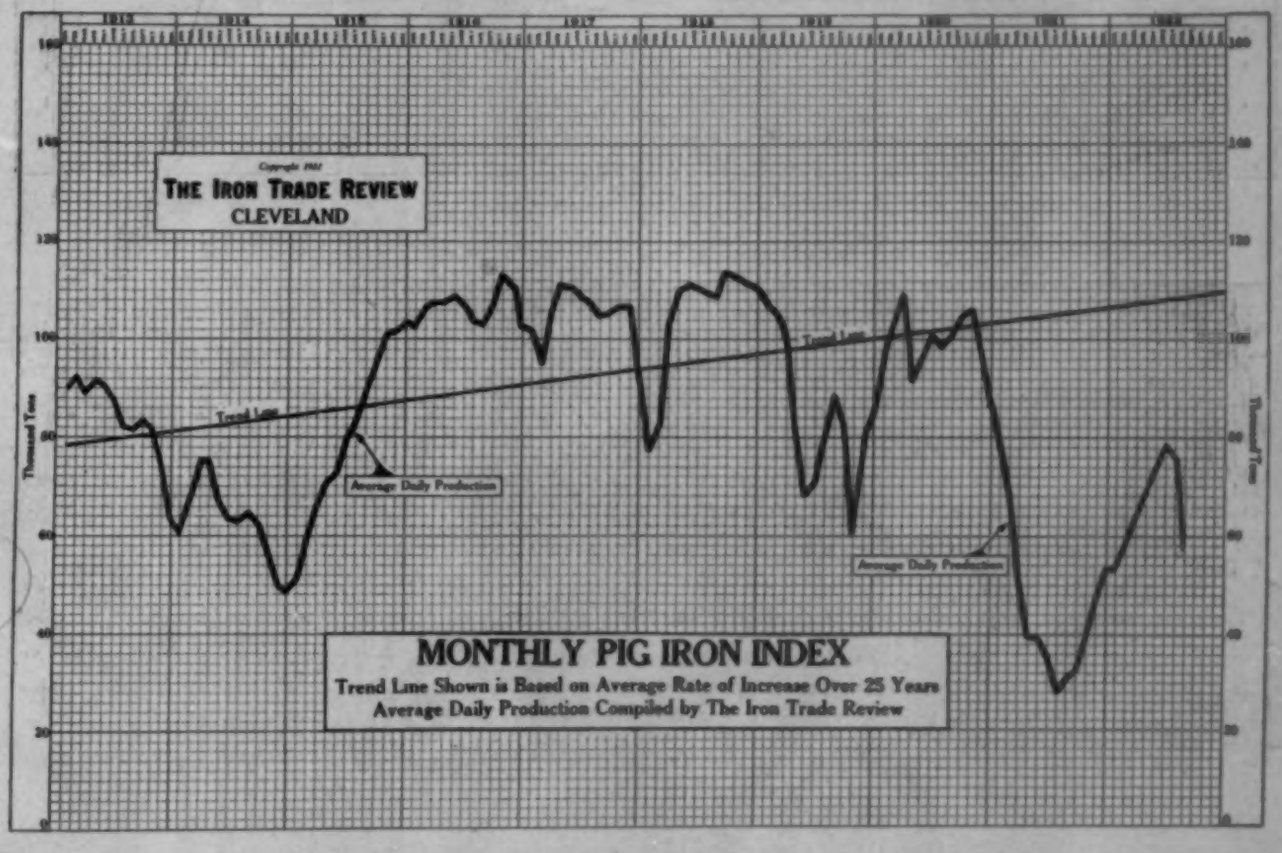
CAR LOADINGS—Carloadings for week ended Aug. 26 touch 890,000, gain of 34,000 in week, and high record for year; end of soft coal strike caused increased.

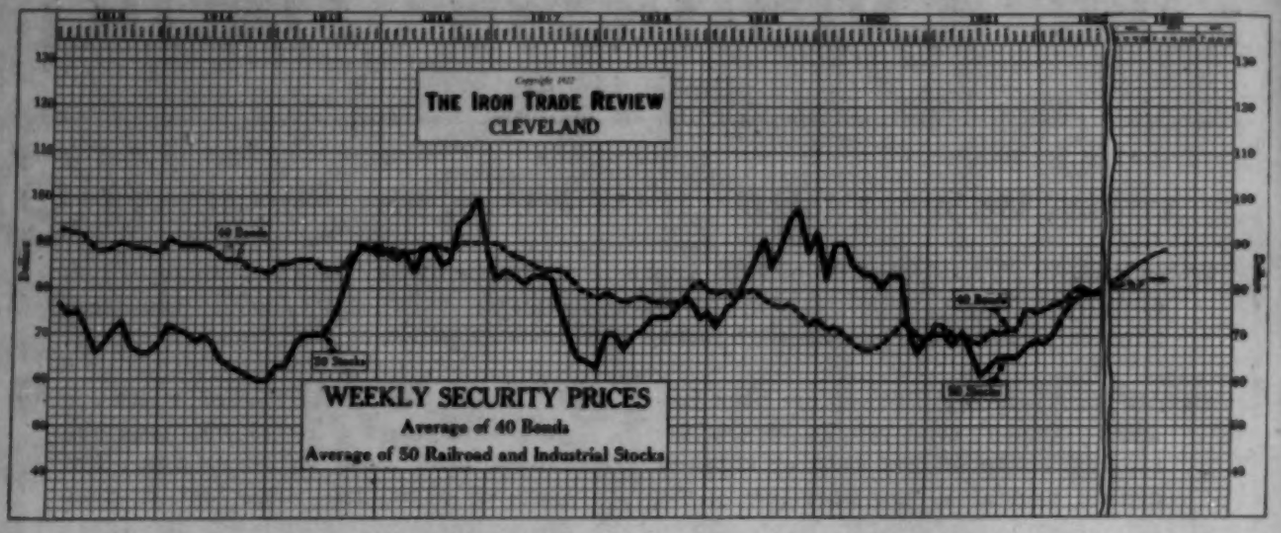
CREDIT SITUATION—Usual preparation against fall crop and trade movement drain upon credit not necessary this year because of enormous surplus of bank reserves.

STEEL FOREIGN TRADE—Coal strike cut July steel exports to 156,000 tons the lowest level since February 1922; imports of 44,000 tons were highest since November 1920.

CAR ORDERS—August orders for railroad cars of 1600 smallest since December 1921; total for eight months is 115,650 cars, or more than four times orders in all 1921.

FOREIGN EXCHANGE—Upturn in exchange rates reflects improved outlook abroad with passing of latest reparations crisis; new debt conference planned in November.

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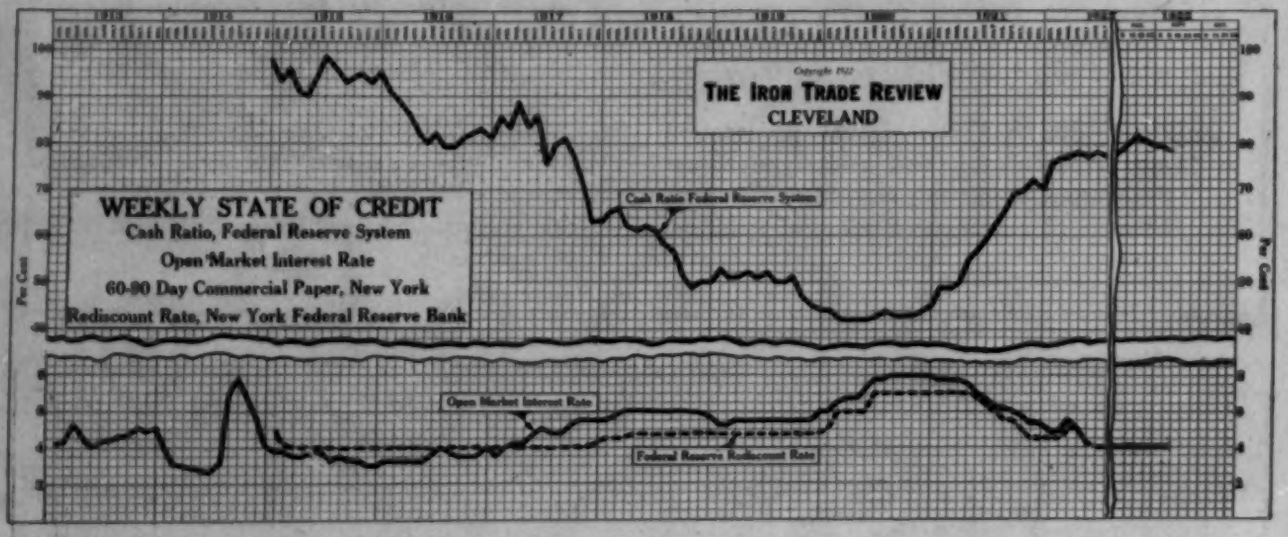
CLEVELAND
40 Bonds
50 Stocks
WEEKLY SECURITY PRICES
Average of 40 Bonds
Average of 50 Railroad and Industrial Stocks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CLEVELAND
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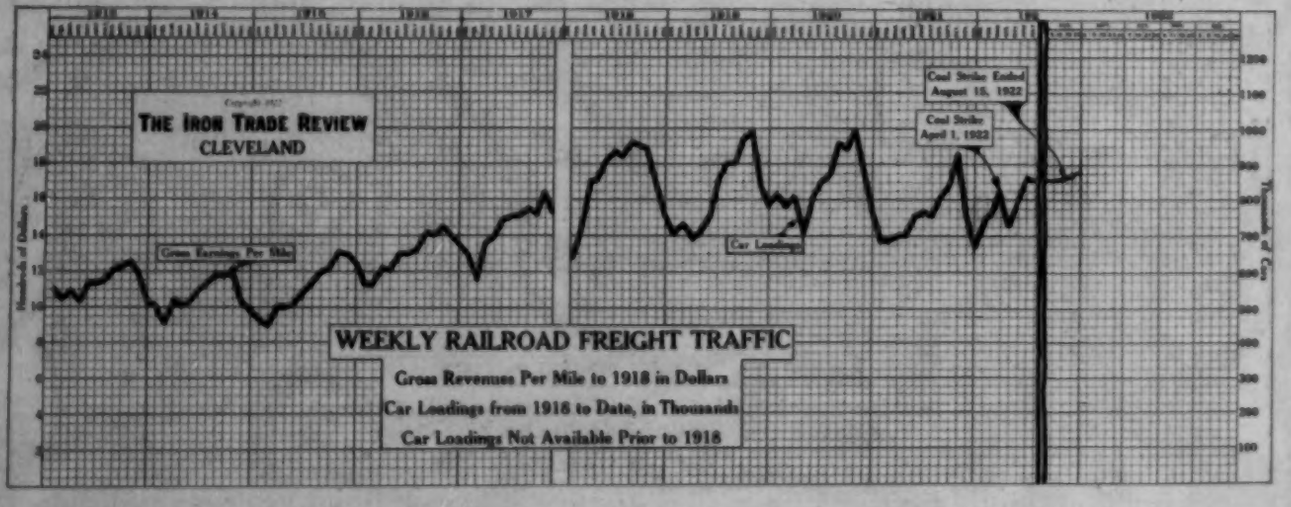
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CLEVELAND
Coal Strike Ended August 15, 1922
Coal Strike April 1, 1922
Gross Earnings Per Mile
Car Loadings
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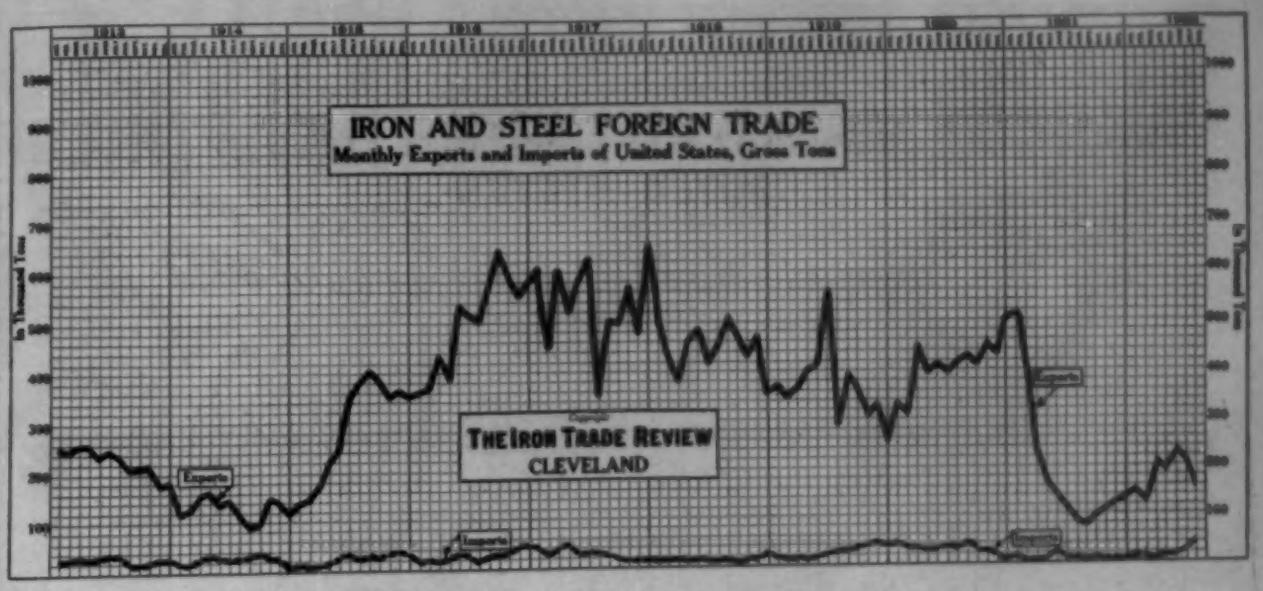
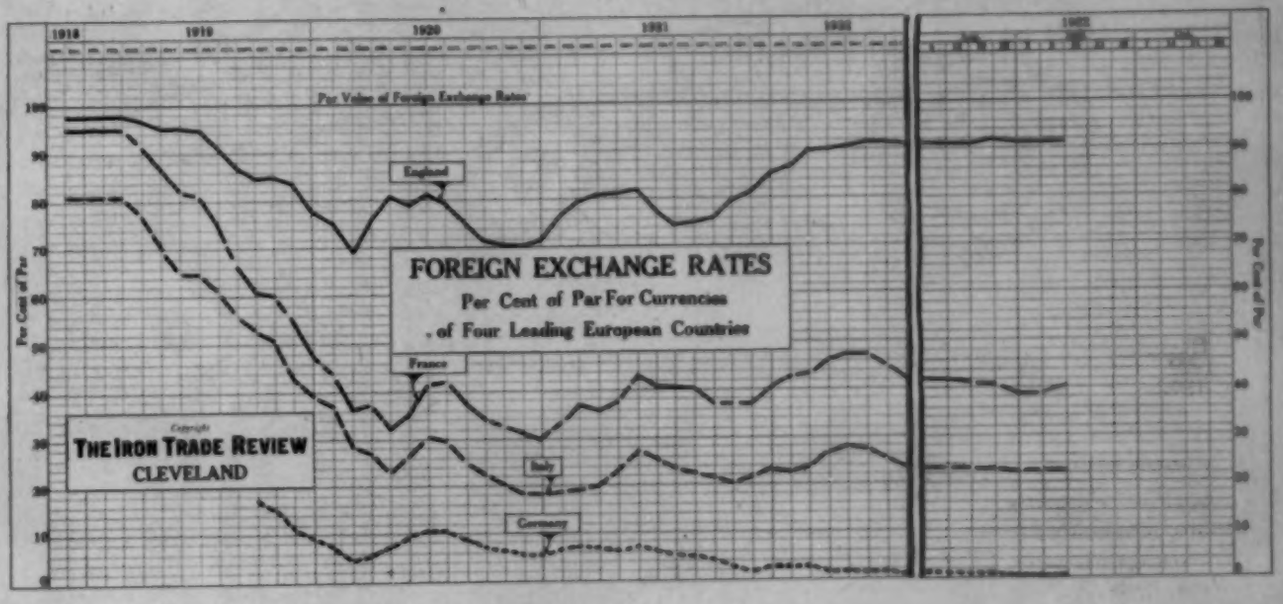
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1916 to Date, in Thousands
Car Loadings Not Available Prior to 1918
Hundreds of Dollars
Thousands of Cars


IRON AND STEEL FOREIGN TRADE
Monthly Exports and Imports of United States, Gross Tons
THE IRON TRADE REVIEW
CLEVELAND
Exports
Imports


Par Value of Foreign Exchange Rates
FOREIGN EXCHANGE RATES
Per Cent of Par For Currencies
of Four Leading European Countries
England
France
Italy
Germany
THE IRON TRADE REVIEW
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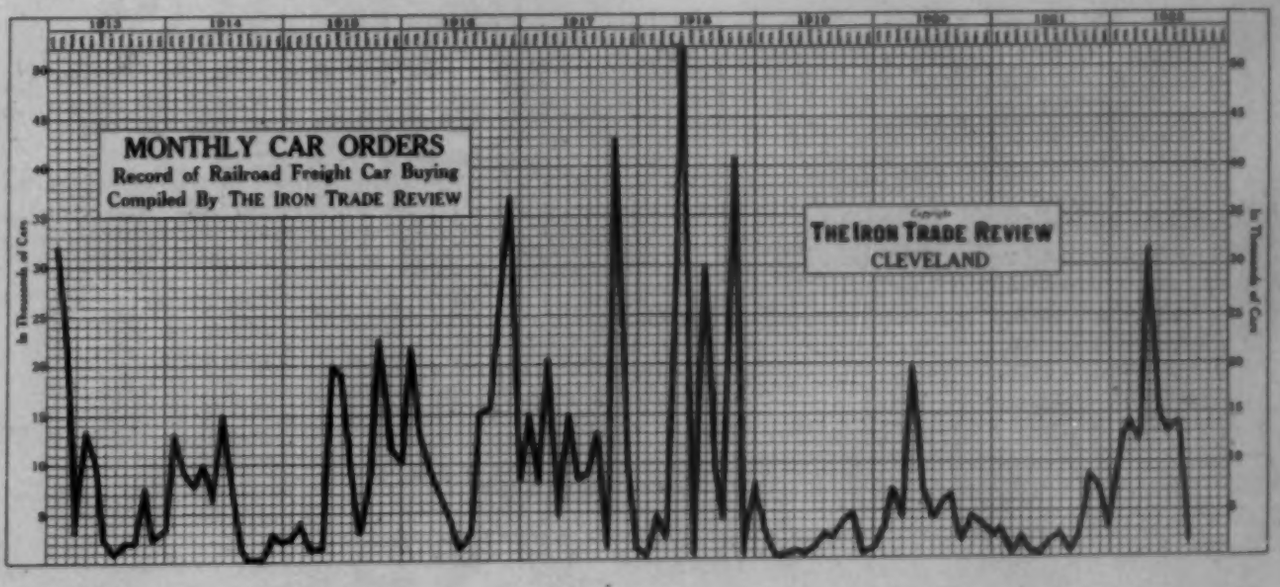
MONTHLY CAR ORDERS
Record of Railroad Freight Car Buying
Compiled By THE IRON TRADE REVIEW
THE IRON TRADE REVIEW
CLEVELAND

WAGES - MANUFACTURING INDUSTRIES

UNITED STATES

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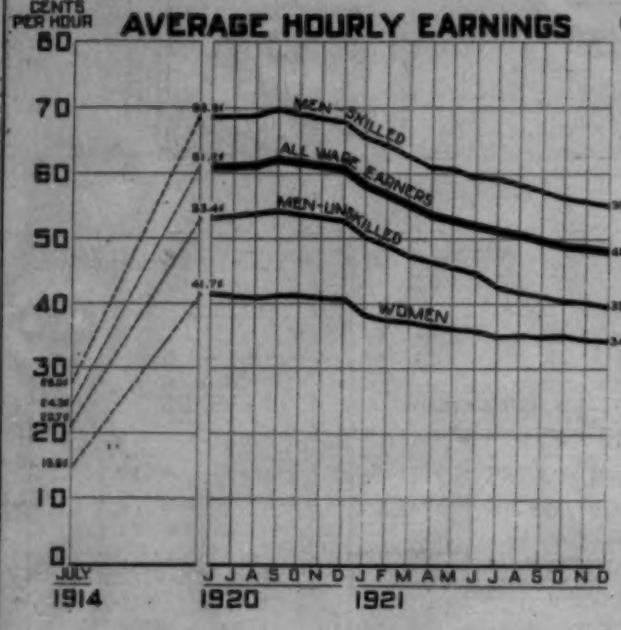

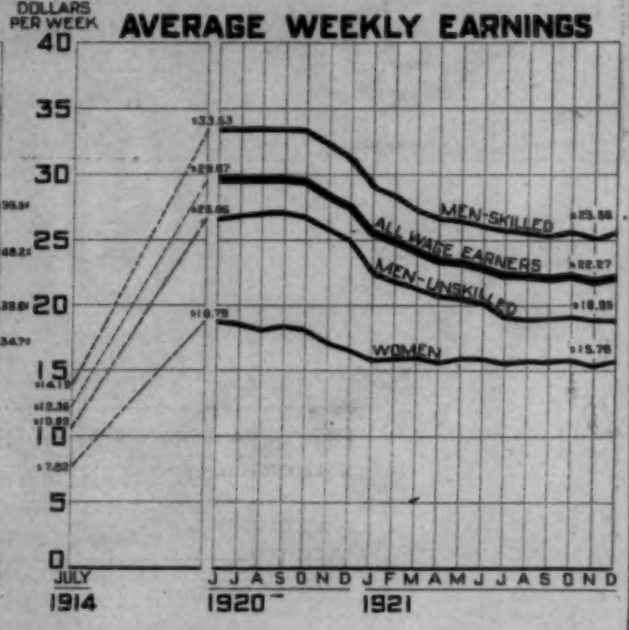

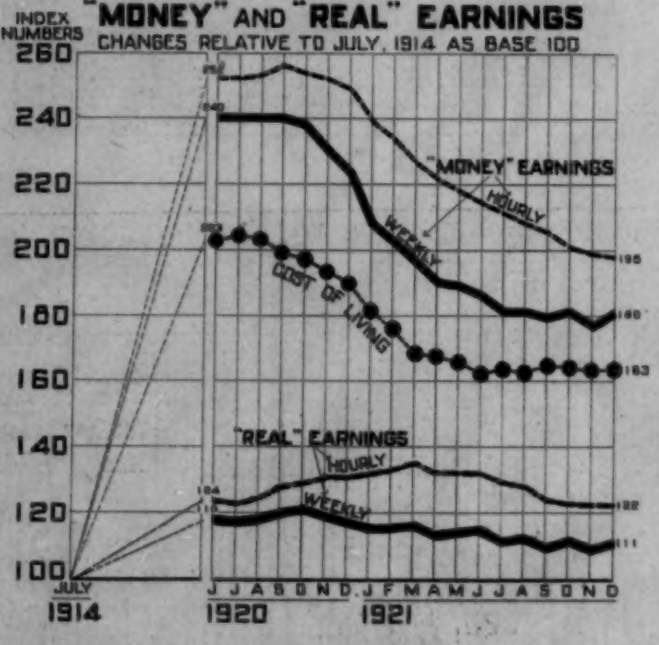

(SOURCE: NATIONAL INDUSTRIAL CONFERENCE BOARD RESEARCH REPORT NO. 52)

Figures for 24 Manufacturing Industries, Covering 3520 Establishments, With 1,068,519 Wage Earners in June, 1920.

This Chart shows that by the end of 1921 hourly earnings of "all wage earners" had declined 22.4% from their peak in September, 1920, but were still 98% higher than in July, 1914; and that weekly earnings, affected by wage reductions and part-time employment, had declined 25.0% from their peak in July, 1920, but were still 80% higher than in July, 1914.

"Real" Earnings Means Purchasing Power of "Money" Earnings Ascertained by Dividing "Money" Earnings by the Cost of Living.

Notwithstanding the marked drop in "money" earnings from the peak of 1920, "real" hourly earnings in December, 1921, were 22% higher, and "real" weekly earnings 11% higher than in July, 1914.

This shows that the economic status of the wage earner was higher in December, 1921, than in July, 1914, measured by the same standard of living.

Wire Rope Interlaces Industry

Fiber Core Is an Important Adjunct in Preserving the Shape of the Product—Strands Vary in the Number of Geometrical Combinations of Wires—Bulk of Orders Demands Special Execution—Description of Wire and Wire Ropemaking

BY JOHN D. KNOX

TAKE wire rope out of the world today and industry practically would be paralyzed. Without this product the great Panama canal might have been a myth. Climb 10 or 15 flights of stairs each morning to gain access to your office in the sky-scraper and you will realize more fully the convenience made possible by wire twisted into strands and these in turn twisted into elevator rope. Upon wire rope depends the essential of life—food, shelter and clothing. Ninety-five per cent of the agricultural implements manufactured today, including gang plows, reaping and threshing machines, etc., use wire rope in one way or another for tilling the soil and in preparing the grain for the consuming public.

Scarcely a residence stands today in the construction of which wire rope has not played an important part. Back in the quarry the heavy blocks of stone were hoisted by this type of rope and delivered on an aerial cableway to the flatcar eventually to find their way into the foundation. Back in the logging camp the massive trunks were skidded over the ground by wire rope traveling around sheaves and drums and were hoisted on cars bound for the saw mill that man's desire for shelter might be fulfilled. Even the mining of the clay that enters into the construction of a brick house or the slate that protects its interior is dependable on wire rope directly or indirectly. Compiled in the accompanying tables are practical applications of these products without which many of our important engineering triumphs would fail of realization.

The author is associate technical editor in Pittsburgh of THE IRON TRADE REVIEW.

Beginning of the Industry

The introduction of wire rope into the United States dates back to 1840 when a few lengths, twisted with crude hand tools, were used for pulling boats on the old Pennsylvania canal. Since this modest beginning, industrial activity developed new uses until now some 13 companies in this country are engaged in its manufacture. An important participant in this industry is the Williamsport Wire Rope Co. The plant buildings of this company, in which are housed various departments for preparing steel rods for the wire drawing machines and for twisting the thousands of miles of wire into rope for various usage, are situated on 25 acres of ground about a mile from the business district of Williamsport, Pa. The Pennsylvania and Philadelphia & Reading railroads pass along its boundary and spur tracks from both systems enter the plant enclosure.

The inception of the company dates back to 1887 when it was known as the Morrison Wire Rope Co. During that year several workmen skilled in the art of wire ropemaking as well as power-driven machines were brought over from England and began fabricating the product in a modest building, the photograph of which resembles a village blacksmith shop. In 1900 the company was reorganized and its name changed to the Williamsport Wire Rope Co. Under the new regime the

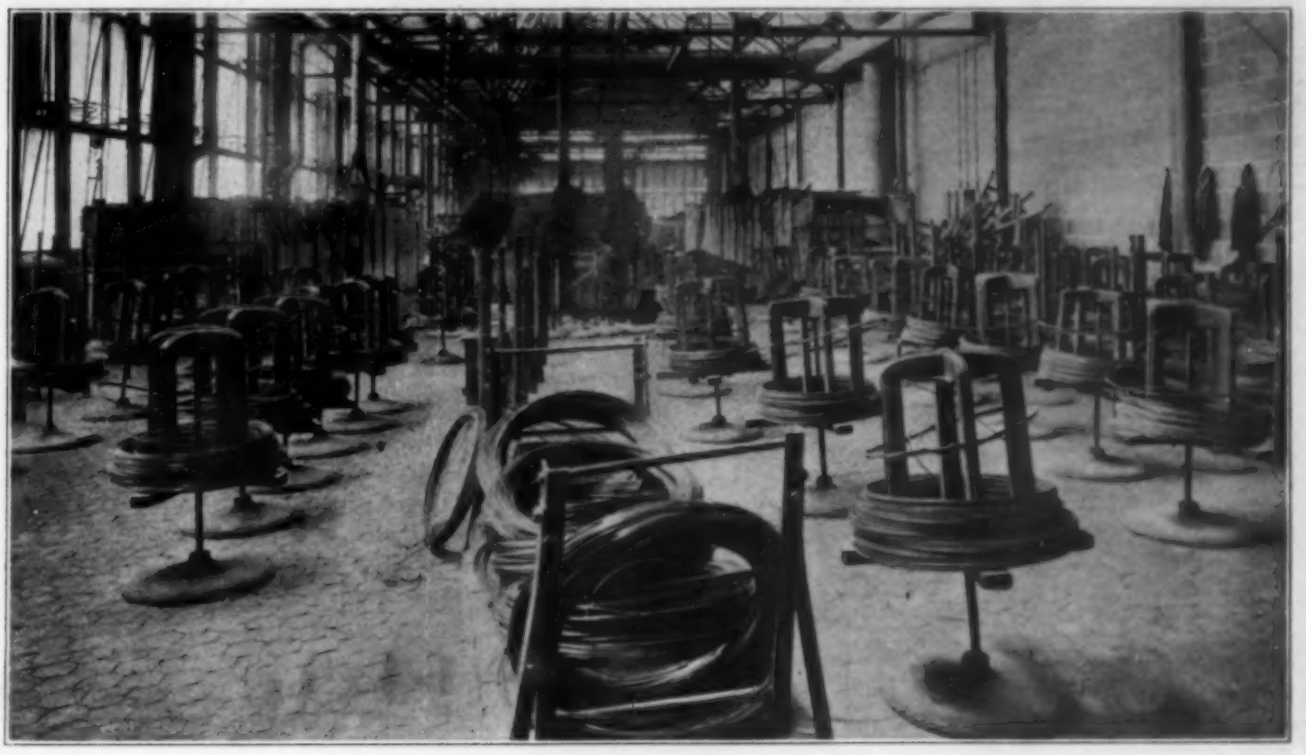

FIG. 1—FRONT VIEW OF PATENTING FURNACES

After several drafts through the draw plates, the wire becomes hard and brittle and before it can be drawn to still smaller sizes its physical condition must be restored. This is accomplished by annealing or patenting in oil-fired furnaces which renders the wire soft and ductile

FIG. 2—WINDING DEPARTMENT WHERE THE WIRE IS SPOOLED

The product is wound on bobbins to afford paying it out evenly during the stranding process and to prevent stopping the stranding machines frequently to join the ends of the wires together

volume of business grew to larger proportions, necessitating the occupancy of the present spacious quarters and in passing it is interesting to note that many of the original English employes who began working in the humble shop 35 years ago still are engaged in the execution of orders for the company. Some are foremen in the various departments and some are still manning the original machines which have performed as many years of service as their overseers.

When the wire rope industry in this country was in its infancy the product was of low grade, having a tensile strength of about 40 tons per square inch. As a result of gradual improvement of the qualities in the metal the product now is made with a tensile strength as high as 160 tons per square inch. The bulk of wire rope orders demands special execution. Each is of a special character, and exactness and vigilance are required of the manufacturer in working out the small details of construction. His knowledge of the business is not confined within the limit of the factory walls but extends to the mines, quarries, logging camps, oil fields and to other industries too numerous to mention where he is called upon to solve the diversified problems within the scope of wire rope application.

Wire rope is manufactured with different numbers of strands and numbers of wires to the strand, twisted around a hemp core according to the use to which each type is best adapted. The process, as followed by the Williamsport Wire Rope Co., begins with the production of wire by drawing a rod of larger diameter through dies, but this is an industry in itself. The rods are rolled by outside sources to a chemical

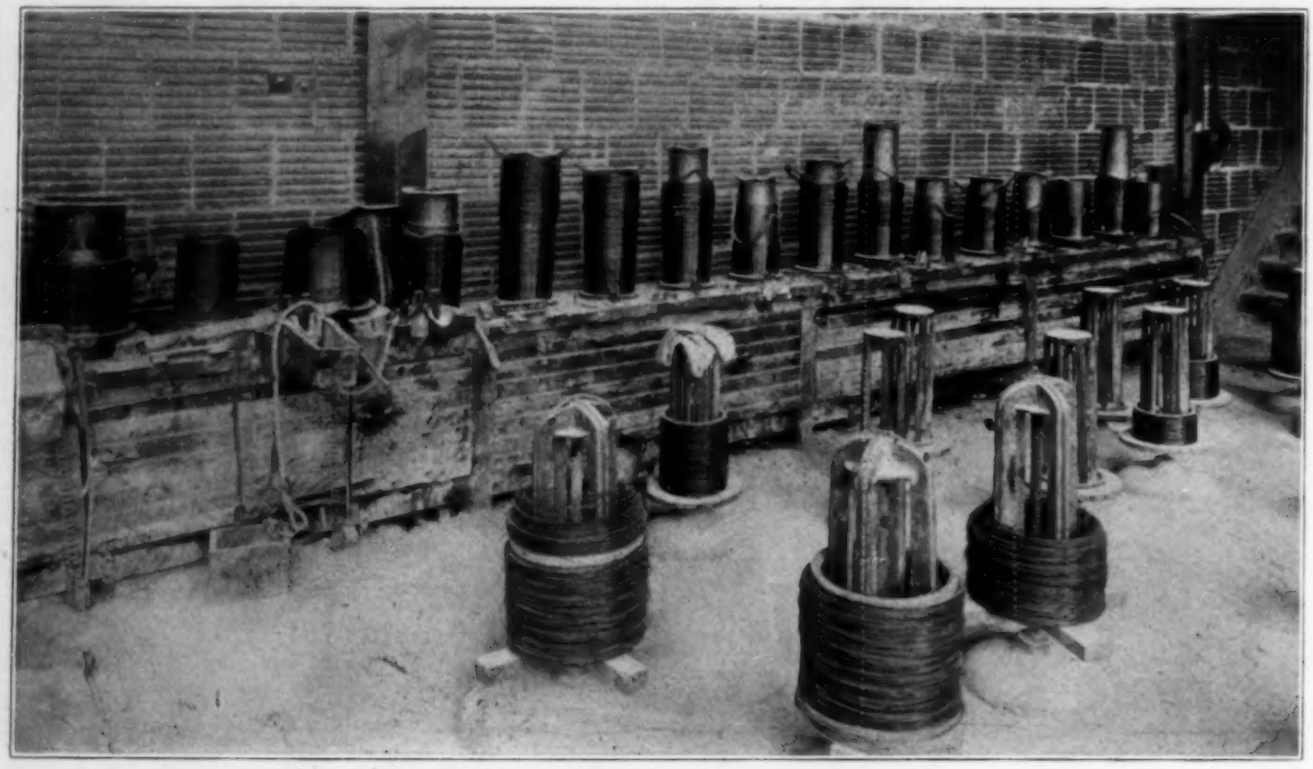

FIG. 3—EARLY TYPE OF WIRE DRAWING BENCH

The various drawing blocks mounted on the bench are driven from a line shaft beneath. Each block, which is tapered slightly to facilitate the removal of the coils, is operated individually by a clutch, thus obviating the necessity of stopping all blocks to place one in service

specification and upon receipt of the material the ends from several coils are clipped and forwarded to three umpire chemists for analysis. The analysis accompanying the invoice must check with the reports issued by the umpire chemists before the material finally is accepted, for upon the proper selection of rods depends the success of the company in prescribing the proper rope that will perform efficiently under service conditions.

Once inside the plant enclosure the carloads of rods are shifted into a brick constructed warehouse over a spur track which is laid lengthwise along one side of the building. The rods in coil form are unloaded by crane and arranged in piles on the concrete floor according to their carbon content. Attached to each bundle is a tag showing the heat number, whether basic or acid steel, the carbon content, etc., which facilitates the selection of the proper grade rod before it starts on its mission through the mill. Five different materials are used in the manufacture of wire rope:

1. *Iron.* In the early days of rope-making this material was used almost entirely, but at present it is employed only to a limited extent owing to the development of the stronger and tougher steels. When drawn into wire, iron has a tensile strength of approximately 85,000 pounds per square inch. Its usefulness is limited.

2. *Crucible Cast Steel.* This grade of steel for use in the manufacture of wire rope formerly was made by melting blister steel and scrap in crucibles, pouring the metal in molds, forging the small ingots into billets, and rolling these into rods. The wire, now known as crucible cast steel, is made in basic open-hearth furnaces, the original term having been retained by the trade. Wire drawn from this grade of steel has a tensile strength ranging from 160,000 to 200,000 pounds per square inch, depending upon the size and required properties.

3. *Extra Strong Crucible Cast Steel.* This grade is produced by varying the chemical composition of open-hearth steel so that the tensile strength of wire drawn from it ranges from 190,000 to 220,000 pounds per square inch of sectional area, depending upon the size and properties required.

4. *Plow Steel.* This grade of acid open-hearth steel when drawn into wire has a tensile strength ranging from 200,000 to 240,000 pounds per square inch of sectional area. The term "plow steel" originated in England and applied to a grade of crucible steel wire which was made into ropes for pulling gang plows.

5. *Improved Plow Steel.* This grade is made from special acid open-hearth steel and in wire form has a tensile strength ranging from 240,000 to 280,000 pounds per square inch. Its use is extensive where strength, lightness and abrasive resistance are essential.

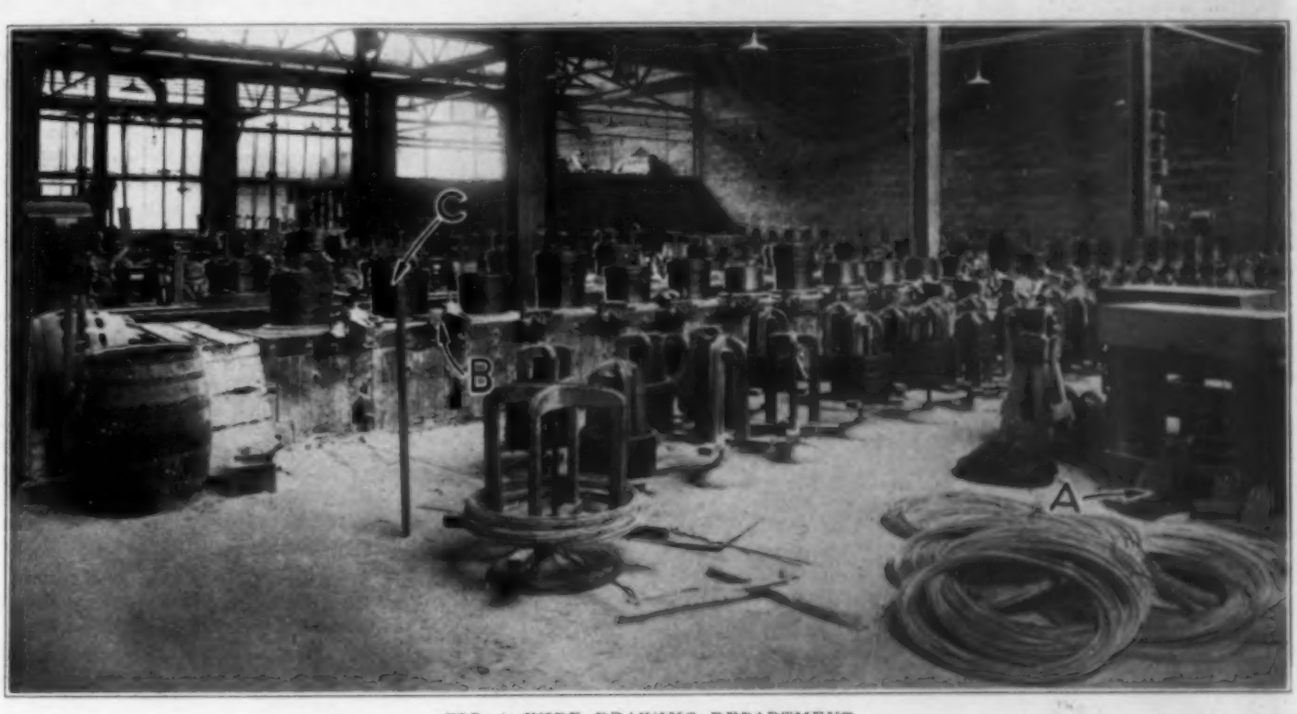

FIG. 4—WIRE DRAWING DEPARTMENT

After the pointed wire is inserted through a metallic box *B* containing powdered soap which serves as a lubricant and through the desired opening in the draw plate, it is attached to one of the motor-driven blocks *C* mounted on the draw bench. When the block is actuated the wire of reduced diameter is wound into a coil. A spare draw plate is shown at *A* and a draw plate clamped in position on the side of the drawing bench at *B'*

Scale Must Be Removed

Before drawing the rods into wire it is necessary to remove the surface scale that formed during the hot rolling process, otherwise it would cut the die during the drawing process and result in imperfect wire. This is done in a cleaning room, walled off from the other departments, in which a series of wooden vats are installed. Some vats contain hot sulphuric acid, some contain water, and others hot lime. The vats are arranged in a semicircle. The rods in coil form are transferred by trucks from the warehouse or are unloaded directly from cars spotted on a siding just outside the cleaning department and several bundles weighing about a ton are immersed for a few minutes in the acid and water. When the scale has been eaten off, the rods are lowered into a vat of hot water to remove the sludge and acid. High-pressure water from a hose also is used to assist in removing any surface substances or acid taint that may remain. The steam for keeping the acid and lime baths hot is generated in two boilers housed in a separate building while the water is obtained from one or more wells on the company's property.

The bundles for three purposes then are dipped in a vat of hot lime mixed to the consistency of milk. The lime coating serves as a lubricant in the wire drawing process, it protects the rod from further oxidation and it neutralizes any remaining acid. High-carbon rods in the cleaned state frequently are put through what is called the sulling process—that is, after being removed from the rinsing bath they are exposed to the atmosphere for a few minutes and then sprayed with water which combines with the slight traces of acid remaining on the surface to form a faint greenish coating known as the sull or water-rust coating. The lime coating then is applied in the same manner as before. The sull coating in addition to the lime coating acts as an excellent lubricant in the drawing down process.

After the rods have been cleaned and coated they are lowered onto a truck, wheeled into an oven and baked from 3 to 12 hours at a temperature ranging from 250 to 400 degrees Fahr. The pur-

pose of this treatment is to dry the coating and to prevent brittleness in the wire by driving out the hydrogen absorbed during the cleaning process. The baking is conducted in brick compartments equipped with tracks and front and rear doors through which the buggies of rods are received and discharged. The ovens hold about 100 buggies at a time, each carrying from 2000 to 3500 pounds of rods. The hot air for heating the ovens travels through depressed and overhead flues.

When the trucks of rods arrive at the rear end of the baking oven they are removed in turn through doors, which open into the wire drawing department, and when sufficiently cool are ready to be drawn into wire. Before the drawing commences a bundle of rods is placed on a reel which operates freely on a vertical spindle. The end of the rod is pointed so that it can be inserted easily through the draw plate. The pointing is accomplished between a set of small power-driven rolls which oscillate back and forth. Several grooves of successively decreasing diameters are provided on the surfaces of the rolls so that by subjecting the end of the rod to the various openings a point about 3 inches long is obtained. The point then is pushed by hand through a hole in the die and is pulled about 2 feet by tongs, which operate back and forth, so that it can be attached to a gripping device on the drawing block.

Several blocks are mounted on a long bench and are electrically driven from a lineshaft beneath. Each block can be operated individually. By engaging a clutch the block starts to revolve, pulling the entire length of the rod through the die hole and winding the resultant wire into a coil. Each block is tapered slightly which facilitates the removal of the coils. The drawing speeds vary according to the diameter of the wire and the physical characteristics of the steel. Wire of high tensile strength is drawn at a slower speed than that of a lower tensile strength while wire of high ductility can be drawn at a faster rate than that which is less ductile.

FIG. 5—MACHINES FOR TWISTING THE STRANDS INTO ROPE
Several bobbins of stranded wire are rigged on the skeleton-shaped shaft, which when actuated twists them together around a fiber core at the forming head *A*, the completed rope passing around a drum and thence onto a large wooden spool for shipment

The die for reducing the diameter of the wire is clamped in a metal box on the side of the drawing bench. The box contains powdered soap through which the rod passes during the drawing process. Particles of soap are carried along and these serve as a lubricating film which prevents rapid wearing of the die. The draw plates, as shown at *A* in Fig. 4, shaped similar to a paddle, are made of tungsten steel and contain several countersunk holes, which taper from the back to the front of the plate. The holes at the face of the plate, which is placed toward the drawing block, are punched to the correct diameter of the wire. Constant watching is required to keep the plates in condition. When the plates become worn they are heated and hammered to reduce the diameter of the openings and are again punched out to the next larger size.

Why Annealing Is Necessary

After the wire has been given one draft the drawing process is repeated through dies of successively smaller openings until the wire becomes so hard and brittle that its physical condition must be restored before it can be drawn to still smaller sizes. This is accomplished by subjecting the product to an annealing process called patenting which corrects the distorted and elongated condition of the crystals caused by cold working. Several wires uncoiling from reels placed on the floor are passed side by side through a long, oil-fired furnace and at the exit end are diverted upward by a sheave and over by another sheave to power-driven reels. As the wire passes around the sheaves the bending action causes considerable scale to crack and fall to the floor. When a more uniform structure is required, however, the wires issuing from the furnace are passed through a bath of lead whose temperature is maintained at about 850 degrees Fahr. and coiled on reels built similar to the wire-drawing blocks. The patenting process scales the wire and hence each coil is cleaned, coated and baked in the same manner as the rods, before being returned to the draw benches for drafting to the finished size.

Every bundle of wire upon being drawn to finished specifications passes to the inspection department where it is tested for tensile strength, elongation, bending and torsional qualities, and scattered throughout the plant are various other inspectors who guard every step in the manufacturing process. Tags showing the result of the physical tests then are attached to each bundle and the wire either forwarded to the storehouse or to the galvanizing department to be coated with zinc preparatory to making into wire rope intended for guys, hawsers, ships' rigging, etc., where exposure to the action of salt water or to the atmospheric element either periodically or constantly results in corrosion. In the galvanizing process several wires are threaded side by side through a solution of hydrochloric acid, then through a bath of molten spelter, then through a tank of water to cool the coating and finally onto take-up blocks.

Ropemaking Begins

Three distinct steps constitute the making of wire rope: *Winding* the wire on bobbins for the stranding machines, *twisting* the wire into strands for the closing machine and *closing* the strands around a hemp or steel core. As the wire comes

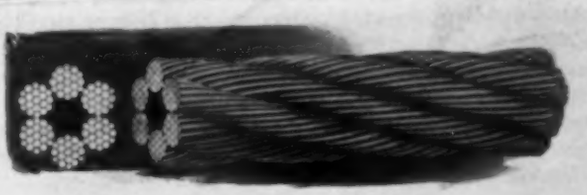

Fig. 6

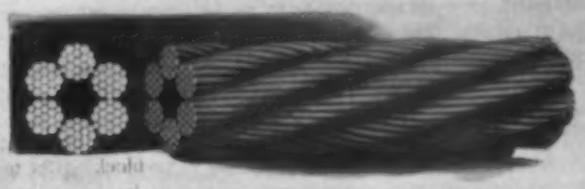

Fig. 7

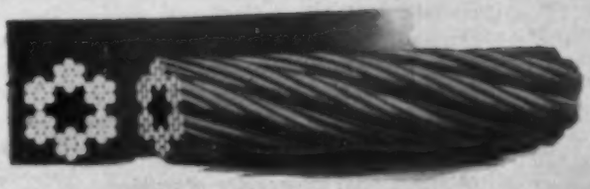

Fig. 8

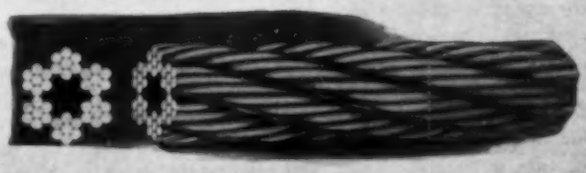

Fig. 9

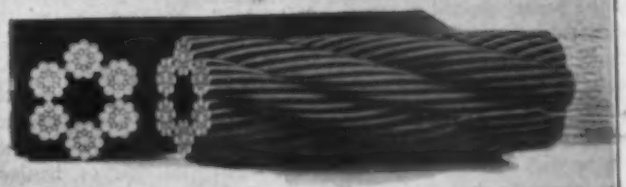

Fig. 10

Fig. 11

Fig. 12

Fig. 13

Fig. 14

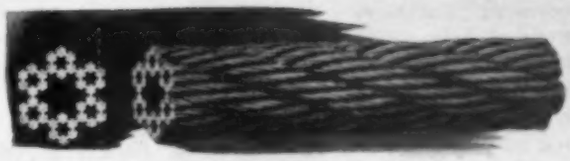

Fig. 15

Fig. 6—Right lay or standard lay wire rope is constructed by twisting the wires in the strand toward the left and the strands in the rope toward the right. Most of the rope used in this country is made in this manner. Fig. 7—Left lay wire rope is twisted in the opposite direction to standard lay and is used for oil well drilling cables. Fig. 8—Lang lay wire rope, the wires and strands being twisted in the same direction. This construction is used for incline plane and haulage rope. Fig. 9—Haulage rope is composed of six strands of seven wires each and is used where abrasion is excessive and bending around sheaves is of minor consideration. Fig. 10—Seale lay rope is composed of six strands of 19 wires each and is used where there is unusual abrasion. Fig. 11—Standard hoisting rope is composed of six strands of 19 wires each and has wide application. Fig. 12—Special flexible hoisting rope is composed of six strands of 37 wires each and can be bent around fairly small sheaves. Fig. 13—Extra flexible hoisting rope is composed of eight strands of 19 wires each and is not as strong as the special flexible construction due to the larger hemp center. Fig. 14—Galvanized running rope is composed of six strands and a hemp center, each strand consisting of 12 wires and a hemp center. It is used for running rigging service where exposure to the elements is frequent. Fig. 15—Tiller rope is composed of six ropes and a hemp center, each rope consisting of six strands of seven wires each and a hemp core, or a total of 252 wires. It is used for steering vessels, operating elevators, etc., where extreme flexibility is required

from the storeroom or testing department it is threaded over sheaves and onto steel bobbins or spools. The wires travel automatically back and forth over a distance equal to the width of the spool. Several spools are wound simultaneously. The wire is spooled for a two-fold purpose. In the first place it affords an efficient means for handling the product and for paying it out easily and evenly during the stranding process; and in the second place it prevents stopping the stranding machines frequently to braze the ends of the wires together.

After a sufficient number of bobbins are wound they are transferred to machines which twist the wire into strands, called stranding machines. As many full bobbins as there are wires in the desired strand are set vertically in various cradles which are suspended between disks placed at the predetermined distances apart. One wire runs through the center of the machine. The wire from each of the remaining bobbins is threaded over a sheave a short distance forward and thence outward through a hole near the periphery of the disk ahead, continuing in a straight line through the various disks until it reaches the front of the machine. It is obvious, therefore, that the twisting head contains the same number of holes as there are bobbins on the machine.

All wires come together at a stationary die and as the various disks revolve the outer wires are whirled symmetrically around the center wire to form a strand. Issuing from the die the finished strand is wrapped several times around a drum to prevent slippage and then is wound on a large steel bobbin. This bobbin is driven frictionally and affords sufficient tension to keep the strand tight on the drum. The disks operate in synchronism at a constant speed while the speed of the drum may be varied to accommodate the size of strand on schedule.

Many Combinations Are Possible

Strands vary infinitely in the number of geometrical combinations of wires as may be seen in the accompanying cross sectional illustrations. In ordinary practice they are made of 7, 12, 19 or 37 wires, depending upon their ultimate use. An arrangement of six wires around a center wire gives a strand suitable for transmission or haulage rope; an additional layer of 12 wires produces a 19-wire strand applicable for drilling lines and hoisting rope; while still a third layer of 18 wires makes a 37-wire strand that is adapted to rope for towing hawsers and hoisting purposes. In the latter case it is self evident that nearly 50 per cent of the wires are on the exterior and these may be worn considerably before the reserve strength of the rope is impaired.

The length of the strand produced by one revolution of the stranding machine determines what is known in mill parlance as the "lay" of the strand and is governed by the speed of the drum. The faster the drum operates the longer the lay and vice versa. The direction in which the wires are twisted into the strand, whether to the left or right, has an important bearing on the commercial value of the rope. Ordinarily they are twisted into strands in the opposite direction to the twist of the strands in the rope.

When a sufficient number of spools containing the strands of wire have accumulated they are transferred to the ropemaking department where the machines for the smaller sizes reach down the aisleways and constantly evict a humming noise under full speed of production. The rope machines simply are hollow steel

Partial List of Wire Rope Applications

- Aerial cables
- Agricultural implements
- Airplanes
  - elevating frames
  - flexible wing tips
  - guying
  - rudder frames
- Ammunition hoists
- Anchor pendants
- Annealing boxes, sheet mill
- Arc lights
- Ballast unloaders
- Battleships
- Bell cords
- Brakes
  - automobile
  - electric car
- Cable roads
- Cableways
- Car curtails
- Car dumpers
- Carriage, saw mill
- Charging doors, open-hearth
- Clam shell buckets
- Clothes lines
- Coal dock haulage
- Coal handling machinery
- Coal hoists
- Coal towers
- Concrete pouring towers
- Construction work
- Controllers, electric cars
- Conveyors
- Counterweights
- Cranes
  - bridge
  - locomotive
  - overhead traveling
- Deep shaft service
- Derricks
- Dredges
  - dipper
  - bucket ladder
  - suction
- Drilling, well
- Elevators
  - hydraulic
  - electric
  - steam
- Excavating machinery
- Ferries
- Freight elevators
  - hand rope
  - hoisting rope
- Gang plows
- Grain shovels
- Guard rails
- Guying
  - derricks
  - ship rigging
  - stacks
- Harness traces
- Hay presses
- Hoisting
- Incline railways
- Launch steering
- Life lines
- Lightning arresters
- Loading machinery
- Locomotive switching
- Lumbering
  - skidding
  - loading
- Mast arms
- Mine haulage
  - endless rope system
  - tail rope system
  - gravity incline plane
- Mineral mines
- Mine shaft sinking
- Mining rope arrangements
- Mooring lines
- Motor boats
- Ocean liners
- Oil fields
  - beam lines
  - casing lines
  - drilling lines
  - pumping lines
  - sand lines
  - sucker lines
- Ore conveyors
- Ore dock haulage
- Ore handling machinery
- Ore hoists
- Passenger elevators
- Pile drivers
- Power transmission
- Quarries
- Railway semaphores
- Ship rigging
- Signal cord
- Skids
- Skip cars, blast furnaces
- Slings, hoisting
- Smoke stack guys
- Steam shovels
- Steering vessels
- Stone sawing
- Stump pullers
- Submarine nets
- Suspension bridges
- Telephone cable suspension
- Torpedo lines
- Towing hawsers
- Tramways
- Trestle haulage
- Trolley wire supports
- Tugs
- Underground haulage
- Whistles
- Winches
- Window weights
- Wrecking cranes
- Yacht rigging
  - foregaff-topsail
  - foresail
  - fore-staysail
  - jib
  - jib topsail
  - main gaff-topsail
  - main sail
  - main topmast staysail
  - small jib topsail

shafts resting horizontally on the floor and are rigged with several bobbins of stranded wire which travel around the shaft. At the rear is a spool of hemp rope which is led through a lubricating bath and thence through the machine to the closing end.

The strands are threaded in toward the center of the skeleton-shaped shaft and, as the machine begins to function, they are twisted together around the fiber core at the forming head, the completed rope in some cases thousands of feet long, passing around a drum and onto a wooden spool ready for shipment to its mission in the industrial world. The spools are manufactured in the company's carpenter shop equipped with modern machines to relieve as much hand work as possible and some are made small and some large, in proportion to the size and weight of the wire rope to be spooled. Current for operating the various rod drawing blocks, stranding and rope machines, and for general usage is brought to the plant over high-tension wires and stepped down to the desired voltage by four transformers.

Core Is An Important Adjunct

Hemp centers provide little additional strength but serve as a cushion to preserve the shape of the wire rope in service when the wires are compressed together by a heavy load. The fiber core is an important factor in wire rope from a service standpoint and its selection depends upon the application of the rope, the absorbing power of the lubricant and the ability to reduce friction. Various grades of fiber cores used include manila, sisal, java and cotton. In some cases the condition under which the rope is to be worked requires a wire core, its substitution increasing the strength of the product about 10 per cent. As a matter of identification and protection to the consumer, the Williamsport Wire Rope Co. has its name printed on a narrow strip of tape which lays in the center and throughout the length of the core of the hemp rope; and tapes of different colors are used to distinguish the various grades of wire ropes which it manufactures.

Ropemaking embraces a wide latitude of combinations. A slight difference in the size of the wires composing the strand, a variation in manner in which the wires in the strand are twisted, or a change in the way in which the strands are arranged around the hemp core results in a thousand and one possible constructions.

Rope made of strands which are twisted to the right and left around the core has what is termed a right and left lay, respectively. When the wires in the strands are twisted in the reverse direction to the strands in the finished product, the rope has a regular lay. Wire rope made in this manner has found wide application in this country and has become standard for general work. Where it is desirable to twist both the wires and strands in the same direction to meet certain requirements of the trade, the rope has a Lang lay, called after the man who devised the combination. This type is more easily untwisted than the regular lay and more difficult to splice, but is more flexible and especially adapted to withstand external wear. The various lays are shown in Figs. 6 to 15.

In the manufacture of standard hoisting rope composed of six strands of 19 wires each, a slight modification of the strands and wires results in certain desirable features which enables different operating conditions to be best met:

1. *One-size-wire* construction is the simplest rope to make. In it the strand is composed of one wire surrounded by six wires, which, in turn, are surrounded by 12 additional wires, all 19 wires being of uniform size.

2. *Three-size-wire* construction, sometimes called the Warrington lay, consists of seven wires of the same diameter surrounded by 12 wires which are made in two sizes and alternately arranged. This combination permits the use of about 10 per cent more metallic area with a corresponding increase in strength. Consequently, it has been adopted in the manufacture of ropes for general hoisting purposes.

3. *Seale* construction consists of one center wire surrounded by nine wires of smaller diameter, which, in turn, are surrounded by nine wires of larger diameter. A strand of this type produces a rope slightly stiffer than the first two mentioned, but makes a perfect mechanical construction. Its use is more extensive on the Pacific coast than in the East.

In manufacturing the many types of wire rope the various steps in the process are alike whether rope is 1/32-inch diameter or that of 2½-inch diameter is on schedule. But the product may be constructed from coarse or fine wire and may be stiff or flexible, and in discussing the various constructions the customary notations will be used, the number of strands being given first and the number of wires per strand last, thus 6 x 7 construction which means six strands, each composed of seven wires. The general classification of wire rope in the order of its flexibility and from coarse to fine construction, and shown in the accompanying illustrations, includes:

1. *Haulage*—This rope is of 6 x 7 construction and is not easily bent around sheaves unless of large diameter. It will resist abrasion. When used for guying purposes the wires are galvanized.

2. *Seale lay*—This rope of 6 x 19 construction is suited only to limited appliion. Owing to its large outer wires it is used under conditions where there is unusual abrasion.

3. *Standard hoisting*—This rope is of 6 x 19 construction also and has a wide and varied list of applications particularly for hoisting purposes. Since the wires are smaller in diameter, it is possible to use the rope on much smaller sheaves than a rope of 6 x 7 construction of the same diameter.

4. *Special flexible*—This type is of 6 x 37 construction. The individual wires are of small diameter and hence the rope possesses sufficient flexibility to bend over fairly small pulleys but will stand little abrasion.

5. *Extra flexible*—This rope is of 8 x 19 construction and while it is about as pliable as the special flexible grade, it is not as strong due to the larger hemp core. However, this rope has more flexibility than the 6 x 19 construction, being composed of two additional strands and may be used over smaller sheaves than the latter.

6. *Running*—This type is of 6 x 12 construction having seven hemp cores, one in the center of the rope and one in the center of each strand. It finds wide application for running rigging service where high flexibility is required and when exposed to the atmospheric elements is galvanized.

7. *Tiller*—This rope is of 6 x 6 x 7 construction, that is, six ropes laid around a hemp center, each rope being composed of six strands of seven wires each also laid around a hemp core. This type is the most flexible standard rope made, and is capable of being bent around small sheaves. Its use is limited to light loads owing to the fine wire construction.

Lubrication Prolongs Life

Beginning with the unreeling, the life of a wire rope is dependent upon many important factors. Its life is increased materially by proper lubrication because the lubricant keeps out moisture and lessens the friction between the wires. The lubricant should be free from acids and corrosive substances and of a consistency that will penetrate to the center of the rope. When not in service it should be coated with grease, otherwise the wires will rust easily. In coal mine application the action of sulphurous water exerts a deteriorating effect on the wires and to preserve the strength of the rope the usual practice is to apply a coating of heavy lubricant externally. Other conditions, which affect the maximum service, include sheaves and drums, speed, overwinding, stresses, crosswinding, reverse bends, and working loads. In the latter case the usual factor of safety is conceded to be one-fifth of the breaking strain but it generally is understood that this factor depends upon the nature of the application. Where passengers are raised and lowered in connection with passenger elevators and coal mine shafts, the working load should not be more than one-tenth of the breaking strain of the rope.

Officers of the Williamsport Wire Rope Co. are: Joseph W. Cochran, president and treasurer; C. La Rue Munson, vice president; Robert Gilmore, general manager; and Edgar Munson, secretary.

The soviet government is now trading scrap iron and steel for grain and flour. The Russian press states that the Petrograd branch of the foreign trade commissariat of the soviet government has contracted to make such trades with Finnish firms. To date 65 cars of scrap have been sent into Finland under this arrangement.

Traces Electrification of Mills

Early European and American Installations Are Compared—All Drives Have Operated Satisfactorily—Types of Motors, Voltages and Plant Economy Are Discussed Briefly—Utilization of Central Station Power Simplifies Equipment

BY B. G. LAMME AND WILFRED SYKES

FROM the flexibility standpoint, the electric power possesses enormous advantages. By means of proper converting devices, either of the two outstanding systems, namely, alternating or direct current, can be utilized according to the needs of the problem. Each system possesses peculiar merits of its own. The alternating current system is flexible in voltage, so to speak, but the normal alternating current motor is inflexible in speed. The direct-current system, while more or less inflexible in its voltage possibilities, permits greater flexibility in variations and control of speed. Consequently, in many large mill installations, both direct and alternating currents are used. One of the great limitations of the alternating-current motor in some applications and one of its great merits in other applications, is its inflexibility in speed. It tends to run at a constant speed, and speed variations are not practicable except through the medium of extraneous devices. It is more or less independent of voltage limitations and thus is applicable where large powers are required and where the problem of carrying such power to the point of application is a large problem. For this reason in heavy mill work in general where extremely large motors are used, alternating current has been adopted almost exclusively. The same is true in other power applications of large units, such as ship propulsion.

On the other hand, where economical speed control is desired, over a wide range, direct current oftentimes furnishes the most economical solution of the problem. As stated before, the one great advantage of the direct current motor over any other type is in the flexibility of its speed control. For this reason it is not infrequent, in large power installations, to find considerable units of power transformed from alternating to direct current simply to meet economical speed control problems. A striking instance of this is found in the large electric reversing mills, many of which have been installed throughout the country in recent years. Here we have even more than economical speed control, for through the medium of the alternating-current to direct-current transforming equipment, we are able to flatten out the enormously fluctuating power due to the nature of the load, so that comparatively uniform power is taken from the generating system. Here we have the means for transforming from steady power to a violently fluctuating one, or vice versa. This is simply one illustration of the possibilities of the electric system in regard to flexibility.

From the durability and maintenance standpoints, electric machinery, in general, ranks high. It is not unusual to find electric machines 20 years old, or more, which apparently are in as good condition as new. Wearing parts, as a rule, are confined to the mechanical parts. In electric locomotives, for instance, there may be mild inspections daily, or at some other frequent interval, but complete overhauling may occur only at long intervals. Compared with the corresponding steam locomotive in similar service, electric locomotives get comparatively little attention, oftentimes much less than the most economical maintenance called for. The same is true, in general, of other applications of electrical machinery. People have become so accustomed to the idea of reduced attendance and reduced repair in connection with electrical machines, that often they carry the matter too far for the best results.

Reasons for Electrification

It may be stated definitely and positively that the general trend in all industries is toward electrification. Many of the reasons for this have been indicated in the foregoing. In some cases, one reason has dominated, while in other cases there have been other reasons. Nevertheless, the trend is definite. Here and there appear occasional tendencies to break away from this, but a general review of the situation has shown that such departures are not persistent or have made no headway. Centralization of power generation is coming, or in many cases, is already here. Many industries which formerly manufactured their own power are now buying it from those who make a business of such manufacture. Even with those industries which are so large in their requirements that they can well afford to manufacture their own power, such manufacture is becoming a department in itself and is following the same tendency toward general centralization. This seems to be the direction of the greatest economy, as a whole, and isolated or sporadic examples to the contrary do not in any way disprove this tendency. The trend toward the use of electric power has been so strong and so steady over so many years that nothing outside of some radically new discovery, not yet in sight, can overcome it. In the electric current we have something intangible, without weight and apparently without mass or movement, yet which can be available for use on a moment's notice, and which can accomplish a greater variety of purposes than any other known force or power. It is this readiness to serve in these days of general unreadiness which makes it stand out so distinctively as the "servant of mankind."

Electric motors were placed in steel mills at a very early date. These machines were ordinary motors and were not designed for mill service. Five hundred volts was used in some of the first installations, as this enabled the standard railway motors to be used. Experience soon showed that this was too high a voltage, on account of danger to workmen and also due to insulation failures. Mill type motors were later developed and this design is still used with little change.

Regarding the development of main drives, the Europeans were about 10 years ahead of the United States in applying motors. The first motors were put on mills in Europe about the middle of the '90's and, as in this country, the first machines were direct current. At an early date, however, induction motors were used for mills where speed changes were not required, these motors usually being belt or rope connected.

The European motors have developed along somewhat different lines than those built in America. In general, tonnage has not been such an important feature in European mills as in American plants. The business conditions have been such that each mill had to produce a wider range of material and flexibility has been a more important factor than tonnage. We find in most European plants a great variety of mills which are not kept fully occupied, but are necessary to supply the varying demands of the customers. This naturally

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From a paper presented at the Cleveland convention of the Association of Iron and Steel Electrical Engineers, Sept. 11-15. B. G. Lamme is chief consulting engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and Wilfred Sykes is assistant to operating vice president, Steel & Tube Co. of America, Chicago.

required that the equipment should be kept as cheap as possible, which no doubt accounts for the light construction used.

In recent years, through consolidations and other arrangements, the mills are being laid out to produce a few classes of products and to bring up the tonnage of such products, the market being supplied by the correlation of a number of manufacturers. This has led gradually to a practice approaching the American. However, the machines in use today in Europe are built much lighter than would be considered advisable here and what would perhaps strike the American mill man as peculiar is the almost universal use of hand-wound coils in partially closed slots. The use of form wound coils for induction machines has not been at all customary except by some of the English manufacturers. While all apparatus is subject to failure in itself, it is necessary to so design our American machines that repairs can be rapidly made by the operating force and for this reason the windings are universally of such a type that they can be replaced or repaired by the ordinary mill force. This is not the case with the European designs, where really skillful winders are required to produce satisfactory results.

As previously pointed out, one important factor in European mills has been the requirement of flexibility, and while we have had the same problem here, it has not been so pressing. This lead to the use of various schemes to obtain variable speed drives and consequently a number of the arrangements used today were developed in Europe.

That these schemes were not adopted by the United States in early years was due to two factors, first the demand for the adjustable speed drive was not so urgent and, secondly, arrangements were used in Europe where skilled attention could be insured which would not be practical in the United States and it has been found necessary when European designs have been brought here to simplify or improve them for American conditions as the machines and accompanying apparatus must be more foolproof and capable of withstanding heavier service.

History of Early Installations

In the United States, the earliest electrical drive of any size was the motors driving the light rail mill at Edgar Thomson works of the Carnegie Steel Co. These machines have been in use for 17 years with practically no delays and no cost for maintenance. Shortly after this, the American engineers were called upon to build machines for what still remains the greatest mill electrification—the Gary plant of the Illinois Steel Co. The boldness of the engineers in laying out this plant has been more than justified and many of our members will accept Gary as a normal development. It is perhaps not so well appreciated as it should be that this was a great engineering undertaking which involved many different problems. In the first place, a gas-engine driven power house of this magnitude had never been attempted before and grave problems were involved in insuring stability of operation. The design and building of the slow speed induction motors used for driving mills in sizes for which there was no precedent was a great and successful undertaking. A highly important factor in this connection was the control apparatus for handling the power involved and all American engineers interested in steel mills are indebted to the pioneer work done at the Gary plant for many of the commonplace practices of today. With the success of the Gary installation and of many other installations which went in about the same time, there was little question as to the use of motors for driving mills when the speed conditions and power supply seemed favorable.

Gearing Aids in Advancement

One great impetus to the advancement of electric drive has been the development of adequate and reliable gearing. This has rendered the slow speed motor to a large extent unnecessary, thereby eliminating one of the troublesome features of electrification. These slow speed motors were expensive and nearly always special, which involved a heavy tax for development on practically all installations. With the development of gearing it was, of course, a simple matter to change the ratio so that the development charges from an electrical standpoint could be much reduced, and tended to become less and less as installations were made.

Regarding development of the reversing mill, this was a direct outcome of the successful application of the Ilgner system to large mining hoists in Europe. During 1905 investigations were made on a steam-driven mill in Austria to determine the power requirements. The data available at that time were meager and a great deal of investigation was necessary to enable an estimate to be made as to the size of motors required.

About the end of 1905 an order was placed for an equipment with the A. E. G. of Berlin which was to develop a maximum of 10,350 horsepower. This equipment was put into operation in July, 1906, and with the exception of a few minor troubles operated satisfactorily from the beginning. Three separated motors were used for the mill and three generators, all being connected in series, the maximum voltage being about 1600. The equipment was divided into three units in this way, as it did not involve such a large departure from what had been built previously, and it was thought that the inertia of the equipment would be materially reduced by keeping down the diameter of the motor armatures. The generators had laminated fields and were completely compensated. A special exciter was used which, operating on a separate winding on the generator field, opposed the main excitation. The opposing field varied directly with the armature current, as the idea was to provide a stabilizing element which would prevent the load exceeding a certain amount.

About the end of 1905 experiments were conducted on a small scale by the Illinois Steel Co. to determine the operating characteristics of the Ilgner system. That system had not been used in the United States for hoisting so that there were no data available as to its operation. In the spring of 1906 an order was placed with the Westinghouse Electric & Mfg. Co. for a reversing mill drive for the 30-inch universal plate mill at the South Works of the Illinois Steel Co.

This equipment was to develop a maximum of 8000 horsepower and it was put in operation about the beginning of 1907. At the time it was designed and built there was of course no knowledge of what was being done in Europe, nor did the Europeans have any knowledge of what was being done in the United States. This equipment has been in continuous service to date, and as the details have been described a number of times, they will not be referred to here. The motor is a double unit and the novel feature of the equipment is that there is only one generator which has two windings. At the time this machine was built it was thought that this construction would be cheaper than single machines, but this did not prove to be the case. Consequently the idea was not utilized in subsequent installations.

From the installation of the first reversing mill in Europe, rapid strides were made and within a few years there were 20 to 30 installations in operation. In the United States there was a period of years from the starting of the first until the second reversing drive was put into operation, although a couple of installations were made in Canada, but from 1915 on the development in this country has been rapid.

Installs Electric Drive in Canada

A second successful installation in America was the Steel Co. of Canada's plant at Hamilton, Ont., which was put in operation in March, 1923. This installation followed closely along the lines that had been developed in Europe. The motors were shunt wound and the generators had interpoles and compensating windings and a laminated field. In addition an arrangement was designed which enabled an excess voltage to be applied to the field of the generator during acceleration to insure quick operation. The mill was originally supplied with a face

plate controller which was subsequently changed to a magnetic switch control, as it was found desirable to incorporate current limiting features which could not be done with a face-plate type. It also enabled the manual effort required from the operator to be reduced, which is quite important when a man is handling a controller from 10 to 12 hours continuously. With the exception of the changes involved in the control equipment, which necessitated short delays for the substitution, the equipment has operated continuously from the beginning. It was found unnecessary to use the control device which was originally built for forcing the fields as the laminated field itself was quite sensitive enough. The motors and generators were connected alternately in the series so that the current in all machines was the same, but the maximum voltage across any one did not exceed that of a single generator.

This was a decided improvement on the European method of connecting all machines in series, but introduced the limitation that there had to be as many motor units as generators. In Europe it is quite common to have two motors and three generators, but this could not be done with such a scheme.

The next installation to be built was for the Bethlehem Steel Co. and this marked a decided departure from the ideas that had existed up to this time. In this installation the idea of making the motor a compound-wound machine instead of a shunt machine was adopted, as distinguished from the scheme that had been used by the A. E. G. of a bucking winding on the generator. The reason for making the motor compound-wound was to insure stability and to facilitate the control. To do this, the indirect winding scheme, which has been described a number of times, was used. The generators were built with solid frame and laminated poles as is standard practice and the field forcing arrangement that had been used experimentally in Canada was introduced, as with solid frame it performed a useful function. By adjusting this device the rate at which the generator field builds up can be made anything desired, which is a good characteristic, as it has been found that it facilitates the starting up of an equipment with an inexperienced crew.

In Europe before the war the tendency was to build the reversing motors as single units, but due to the design limits of the generators a number had to be connected in series to supply the power required. This meant the building of 1500 to 1800-volt motors, which while feasible does not appear to be desirable for mill work. The object of this scheme was to reduce cost, but the danger of high voltage is a factor that would make it very undesirable for American conditions. There is no difficulty in building the largest equipments required as double-unit machines, using two generators and two motors. For small mills single units can be used and in the United States the maximum voltage generally has been limited to about 700, which would seem about as high as it is desirable to go.

As a general comment upon the construction of American and European machines, it may be stated that the American motors are stronger mechanically than the European machines and in general their construction is superior. The general mechanical construction of the flywheel sets built in America has been heavier than that used in Europe, and it is customary to connect the different machines by solid couplings so that there may be five or six bearings supporting the solidly coupled shafts. In Europe it has been customary to mount the flywheel separately from the motor generator, connecting them together through a flexible coupling. In Europe it has been customary to fit mechanical brakes for stopping the flywheel set, but here the driving motor is so designed that it can stand plugging and the control equipment is provided to handle the excess voltage of the rotor under such conditions. This scheme has been found to be entirely satisfactory.

The development of the reversing mill in the United States these last few years has been in details pertaining to the control apparatus, so that now it can be said to be entirely fool-proof and does not require a skilled operator. The current can be controlled absolutely and the apparatus is so arranged as to insure the maximum acceleration possible within the current limits. In this way the maximum output within the limits of the capacity of the apparatus is obtainable. It has changed the characteristics of the reversing mill from one showing high peak loads to an equipment taking a relatively steady current.

In the discussion of economy it is not proposed to go into details of tests as figures are only of value when viewed with a knowledge of the conditions under which the tests are made and other factors which have an important bearing on their significance. It is therefore thought advisable to consider the problem in broader features.

Plant Economy Is Discussed

Considering for the time being mills using steam for prime movers, where we have a complete steelmaking plant with blast furnaces we are usually confronted with the fact that there are conflicting features governing the location of boiler houses. Naturally a boiler house would be located close to the blast furnaces to utilize the blast furnace gas and this frequently is not a desirable location from the standpoint of steam distribution. As the mills expand we have to use either long steam lines, which are uneconomical and expensive to maintain, or let the boiler house and blast furnace take care of local requirements and build one or more additional boiler plants to take care of other power requirements. As soon as we do this, we then run into the difficulty of maintaining efficient operation in a number of plants. Anyone with experience in steel plants realizes that it is only by constant and close supervision that economy in burning fuel can be maintained, as it means that we must either increase our technical staff to take care of the greater number of boiler plants, or as is usually the case, the supervision is not so effective as it would be if the steam generation was all taken care of in one location.

In connection with the boiler plants located at the blast furnaces it is customary to find that the efficiency with which blast furnace gas is burned is low. We have not yet entirely forgotten the time when this gas was considered a waste product and as it cost nothing to produce nothing it was not necessary to be economical with it. That this is not the case any intelligent engineer knows, and we must be just as careful to insure economy from the gas fired boilers as in our coal-fired boilers. It is only within the last few years that an attempt has been made to burn this gas economically, and before general practice is satisfactory, considerable development is necessary. One of the primary troubles is due to the fact that gas burners are sometimes simply inserted into a coal-fired furnace and no consideration is given the fact that the proper conditions for the burning of this gas are entirely different from those required when burning a solid fuel. The consequence is that neither the gas nor the coal is burned economically.

This combination is necessary frequently, as with scattered boiler plants we lose the advantage of the diversity factor of the different consuming units and consequently each plant must be arranged to care for the local peak load. This necessitates the use of coal to insure the maintenance of steam pressure when the load goes up or the gas supply drops. These facts have been pointed out as the explanation of why actual operating results do not correspond with theory, or with test figures obtained under set conditions.

A great deal has been published from time to time regarding the losses from steam piping and undoubtedly the figures are correct for certain definite conditions, but in our mills we do not duplicate these ideal conditions and consequently our losses are greater. We all know that if the piping is insulated properly that steam can be transmitted to considerable distances with comparatively

(*Concluded on Page 724*)

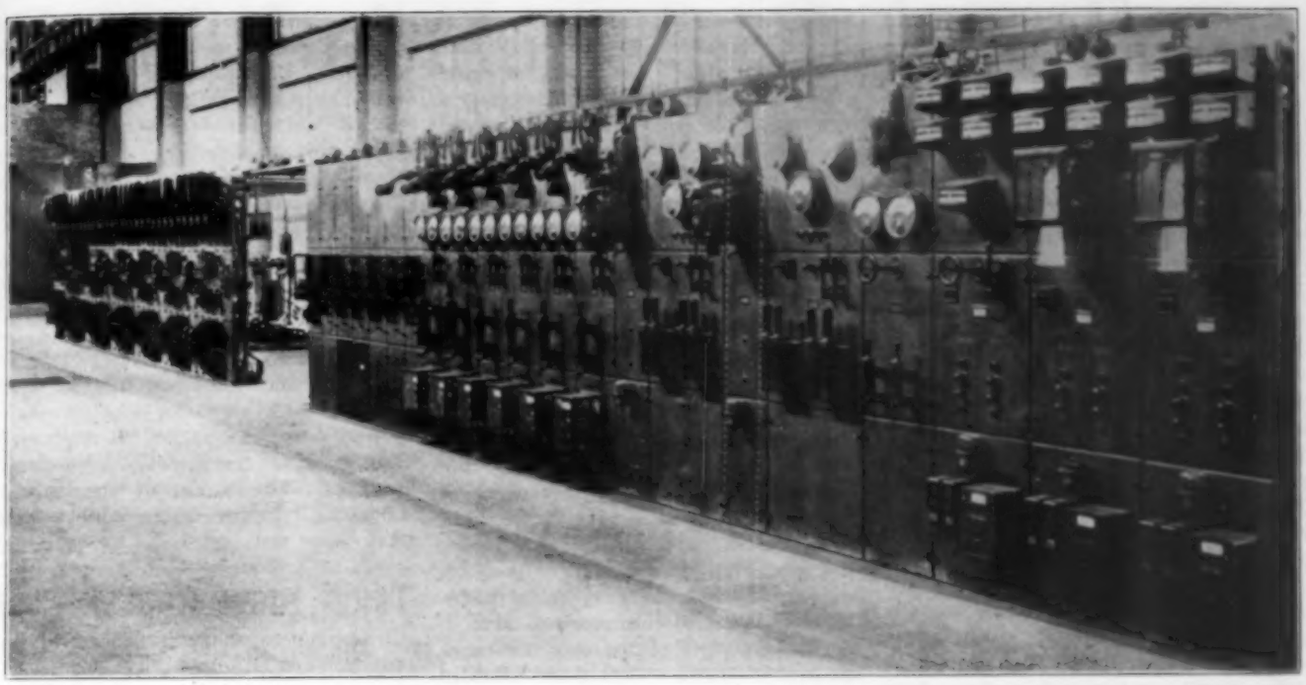


Fig. 1—Switchboard which controls the electric drive of the new 14-inch strip mill of the Trumbull Steel Co.

Builds New Electric Strip Mill Drive

REPRESENTING an entirely new development in rolling mill drive, the recent installation of electrical equipment for the new 14-inch continuous hot strip mill of the Trumbull Steel Co., Warren, O., is of special interest. The mill which was built by the Morgan Construction Co., Worcester, Mass., consists of a roughing train having four stands of horizontal mills, an intermediate train with two stands, and a finishing train having four stands.

A 600-volt, shunt-wound, direct-current motor, which will develop 1250 horsepower at any speed between 175 and 350 revolutions per minute, drives the roughing mill through reducing gears. The intermediate mill is driven by a similar motor direct connected to stand No. 6 and through reduction gears to stand No. 5. The four stands of the finishing mill each are driven by individual 800-horsepower motors of similar design but different speeds. They are direct connected to the rolls.

Two Motors Supply Power

Power to operate the whole mill is furnished by two synchronous motor-generator sets, each consisting of a 2300-kilowatt, 600-volt, compound-wound, direct-current generator direct connected to a 3300-kilovolt-ampere, 2200-volt, 60-cycle, 3-phase synchronous motor. The main shunt fields of the generators and direct-current motors are separately excited from a 250-volt direct-current circuit. All of the electrical equipment used in the installation was built by the General Electric Co., Schenectady, N. Y.

Speed Remains Constant

The control which makes this drive possible does not work on the principle of maintaining a given ratio between stands but maintains constant any speed at which a given motor is set and since each motor speed is constant, the ratio between stands must be constant. It is evident that this scheme being simple is more readily set-up than one depending upon change gears and cone pulleys. On the shaft of each direct-current motor is mounted a small alternating-current generator, known as the pilot generator. The fields of these generators are connected to the exciter bus which is supplied by a small generator and controlled by a voltage generator. This maintains constant excitation on the generators, therefore the delivered voltage of any one of them will be proportional strictly to its speed, which is that of its direct-current motor.

This voltage is used to actuate a voltage regulator that cuts resistance in and out of the direct-current motor field circuit. For instance, if the motor speed drops off for any reason, the voltage of the pilot generator, being reduced, will cause the regulator to cut resistance into the motor field, weakening it and bringing up the speed. In case the motor speed goes beyond its set limits, a reverse action takes place. The use of an antihunting winding on the regulator, which causes it to break its contacts without waiting for the motor to come up to speed, prevents hunting on the part of the motor.

Adjustments of the speed on any individual motor are made from the pulpit of the mill, by means of three rheostats, one being motor driven. The latter changes the resistance in the motor field and adjusts the voltage regulator coil circuit simultaneously; the second makes small changes in the resistance of the pilot generator field. The third is used as a "range finder" in connection with a meter in the operator's pulpit, to keep the regulator operating in approximately the middle of its range. The combination of the three gives what practically amounts to an infinite number of points, or a continuous curve between the maximum and minimum speeds of the motor, the regulator automatically maintaining any speed at which the motor is set. In addition there is mounted in the pulpit a special voltmeter for each motor, calibrated in revolutions per minute, and actuated by the voltage of a tachometer generator. These meters are particularly useful when a new set-up of the mill is being made, and also serve as speed indicators while the set is in operation.

Rolling Service Is Satisfactory

That this control will hold the motor speeds constant under changing load conditions and will not allow the speed ratio to vary enough to cause loops or to pull the strip was thoroughly demonstrated in preliminary tests at the factory before the

order was placed and experience with the apparatus in actual production has been satisfactory. The mill may be set-up for a different product in 15 or 20 minutes and the first piece is put through at full speed.

The control is simple and easy to operate, regular operators experiencing no difficulty in handling the equipment. In fact, the first day of operation, in spite of the numerous delays for minor adjustments such as are always necessary when breaking in new machinery, the mill produced 130 tons of strip for shipment.

Previous to this installation this type of continuous strip mill has been driven from two or more sources of power and the ratio of roll speeds has been fixed by means of gears on the roughing and intermediate stands and by belts and pulleys on the finishing stands. It is evident, therefore, that since the gears and pulleys are almost never changed, the only possible way to change the draft in any stand is to change the size of the roll. In other words, starting with a given sized billet the reductions made in the various stands of a continuous mill are fixed and seldom are the drafts best suited to all the products which are to be rolled on the mill.

The ideal continuous mill would have individual drive for each stand, at least on the finishing end, thus allowing the use of any desirable combination of speed and draft. This has been done for many years on cold strip mills where the speeds are low, and the distance between stands is comparatively large so that a change in the speed ratio of any two stands does not quickly stretch the metal or form a loop too large to handle. However, a high speed hot mill such as that at the Trumbull plant, finishes at speeds around 2000 feet per minute and the distance between stands is 8 or 9 feet, therefore, the speed ratio between the stands must be maintained with an accuracy closely approximating that of gearing.

Arrangements Made To Test Gage Steels

Length changes in master gages and wear in working gages is of great importance to the ordnance department of the government and to other large users, while dimensional changes on hardening and machinability are serious problems with the manufacturers of thread gages. In appreciation of this situation, Maj. J. O. Johnson, chief of the gage section of the army ordnance department, enlisted the interest of the several groups concerned in these problems and his efforts have culminated in the formation of a committee on which manufacturers of gages, users of gages, manufacturers of steel and the bureau of standards are represented. This committee first met in New York, Jan. 10. B. H. Blood of Pratt & Whitney Co. was elected chairman and H. W. Bearce of the bureau of standards, secretary. Two subsequent meetings of the full committee and one of the steering committee have been held. The committee has outlined a program of experimental work which briefly is to develop a quick wear test for gage steels, to determine the behavior of a selected series of commercial steels in service and to determine the best heat treatment for superior steels. As this program calls for considerable experimental work, the bureau of standards has assigned an investigator, H. Scott, to give full time to these problems. The financial requirements are met in part by a fund of $5000 transferred to the bureau by the war department and an equivalent sum by the bureau. The steels for this work are being supplied gratis by steel manufacturers, and the mechanical work and heat treatment by gage manufacturers. The bureau of standards is conducting length measurements and quick wear tests.

Takes More English Coal

Investigations show that increased importation of English coal into Germany is due chiefly to the decrease in German production which has been going on since March, states Vice Consul Davis, at Berlin, in a report to the department of commerce. In May the average output per day of the German mines was 310,844 metric tons, compared with 326,637 per day in April and 333,862 in March. German industrial circles are reported much concerned over the constantly rising cost of German coal as compared with English.

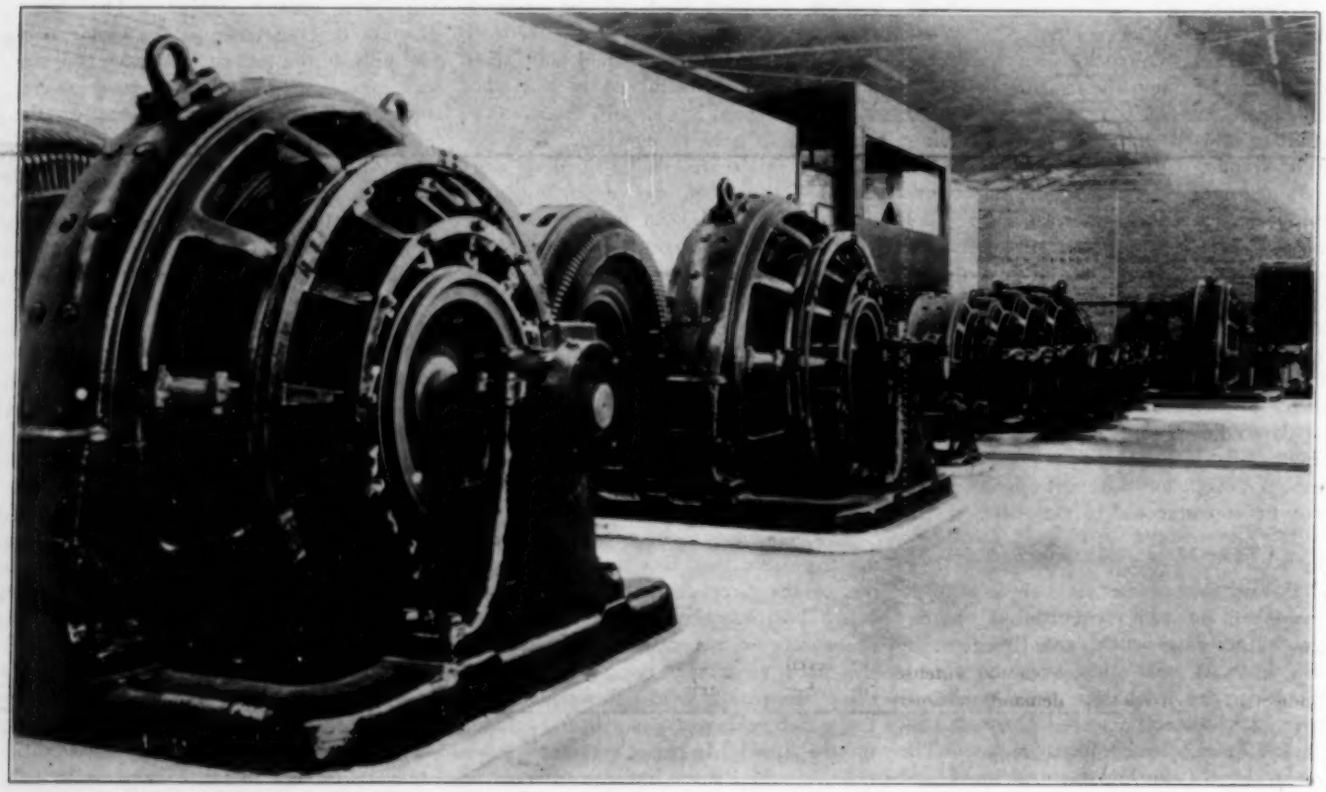


FIG. 2—THE MOTOR INSTALLATION FOR THE ROLLING MILL DRIVE. POWER IS SUPPLIED BY TWO SYNCHRONOUS MOTOR-GENERATOR SETS

Steel Industry Is Safety Force

Has Made Great Progress in Reducing Its Own Accidents, After Initiating Nation-wide Movement To Conserve Life in All Vocations—Historical, Present-Day and Prophetic Sketch of Its Activities

BY DR. L. W. CHANEY

IT IS the purpose of this paper to consider outstanding features of the safety movement in the iron and steel industry under three heads, namely historical, practical, and prophetic. What have been the steps by which the safety movement has advanced? What have been the practical results of the movement? And what may be confidently expected in the future?

It is a salutary proceeding to review any developing movement at reasonably frequent intervals. Such a review, to be worth while, must present with due emphasis the favorable facts and must also submit the claims of the movement to the acid test and point out with entire frankness the places where it fails to measure up to standard. Like all such movements the safety movement has reached a mixed result. It is mainly praiseworthy but no movement can flourish on praise alone. Its fibre will be toughened by wholesome, constructive criticism.

In 1906 the general solicitor of the United States Steel Corp. called into conference the casualty managers of the various subsidiary companies and discussed with them the question of possible reduction of accident occurrence.

There was emphatic reason why such a conference should be called. American industry reached a climax of slaughter in the years 1905 and 1906. For this climax there were several reasons. First, industry had been setting a faster and faster pace, and since machines and appliances were designed with practically no attention to their safe operation but entirely with reference to securing output, the hazard of indusry had been steadily increasing. Second, into American industry those had been coming in steadily increasing numbers alien men unfamiliar with intensive industrial methods and handicapped still further by being unable to communicate freely with their immediate superiors.

How Hazards Increased

The conjunction of these factors was most pronounced in the years mentioned. Especially was 1906 a year of intense industrial activity. The demand for men so far exceeded the supply that there was great shifting from employer to employer and from place to place. Each shift brought the men into new surroundings in which their inexperience contributed to an increased hazard.

Nowhere were these conditions more serious than in the iron and steel industry. The character of the work which it had to offer did not attract the American-born laborer, and the immigrant was not only willing but anxious to undertake any labor which offered him a means of subsistence.

The standard illustration of the influence of a high proportion of non-English speaking foreign-born employes is to be found in Bulletin 298 of the United States bureau of labor statistics. It is shown that per 1,000,000-hours exposure, American-born workers had during a period of eight years 30.2 cases of accident; English-speaking foreign-born had 32.9 cases; while non-English speaking foreign-born had 70.9 cases. The story from the standpoint of severity is similar. The severity rates per 1000 hours exposure are: American-born, 5.3; English-speaking foreign-born, 6.8; and non-English speaking foreign-born, 7.5.

While the facts as we now know them were by no means familiar to the assembled casualty managers of the Steel corporation enough was known to send them back to the study of the problem with renewed attention and purpose. It was not, however, until the early part of 1908 that definite plans began to take form. In that year a central safety committee of the Steel corporation was formed and the subsidiary companies began taking steps in the same direction. In March, 1908 the blast furnaces of the south works of the Illinois Steel Co. organized a departmental safety committee. In April, 1908 the Lorain works of the National Tube Co. instituted a complete system of committees in each of the several departments. In August, 1908 the South works of the Illinois Steel Co. extended its committee system to other departments beside the blast furnaces.

The curious inquirer doubtless can find scattered instances of similar organizations in other industrial fields but the committee system as an important feature of the accident prevention program began with these organizations and has, beyond question, contributed more largely than any other single feature of that program to its present day degree of success.

Some other factors in the early development of the movement deserve mention. For example, it certainly was a spur to activity that magazines began to publish statements regarding accident mortality such as William Hard's "Making Steel and Killing Men." The steel companies were considerably irritated by this and similar publications believing then that the nature of their business was such that any great improvement was quite out of the question. Time has demonstrated that this view was wrong and that condemnation of the conditions which had prevailed was largely justified. What was not justified was the implication that the men engaged in the steel business were calously indifferent to the fate of the men who suffered the hazards of the business. The steel men were honestly of the opinion that the element of great risk was inseparable from their enterprise. An engineer on an important new plant of the steel corporation remarked to the safety consultant; "What you want to do is to enclose this plant in a glass case and operate it from the outside." In the course of time this same engineer developed into a convinced and most enthusiastic safety man.

It was of the utmost importance that early in the development of safety effort the Steel corporation gave up the treatment of its personal injury cases according to the old liability law and established for itself a compensation plan. Under liability it would happen only infrequently that a verdict would be rendered against the company and even this had a rather vague interest due to the fact that it was nearly always handled by an insurance company.

An Advantage in Making Laws

In the development of the compensation laws of various jurisdictions the fact that the Steel corporation and other powerful interests had already set up plans of their own was an advantage which can be scarcely be overestimated.

With the advent of compensation every personal injury case became a potential cost item and the importance of keeping down this cost was emphasized almost daily. Instead of looking for defenses against a possible suit, casualty managers began to look into the causes of accident and seek some method of dealing with them before the accident happened.

The author is associated with the United States bureau of labor statistics. Paper presented at National Safety congress in Detroit, Aug. 29.

As the movement spread into all parts of the iron and steel industry the Association of Iron and Steel Electrical Engineers became interested. First, the members began giving a considerable section of their annual program to the consideration of safety topics. Then the chairman of their safety committee, Lew R. Palmer, conceived the idea of a general organization which should unite the scattered interests which were concerned with the means and methods of accident prevention. The electrical engineers sent Mr. Palmer on a missionary tour of industrial concerns and as a result the first co-operative safety congress convened Sept. 30, 1912 in the city of Milwaukee. It would have made a rather meagre showing but for the presence of the foster organization, the electrical engineers. The program was not the huge affair that it has since become but it was of good quality and was received with a greater degree of interest than had been anticipated.

The aftermath of the congress was a committee on organization which made the arrangements for the second congress and prepared a formal constitution which was adopted during the sessions of the second congress.

The safety departments of the steel companies were very largely developed from casualty bureaus and the period under consideration witnessed a beginning of the transformation of the casualty manager into the safety engineer. In the effort to utilize the tools of his trade, namely, the safety committee and the compensation system, he began to demand statistical information which had not hitherto been available.

New Standards Formulated

In response to this demand the United States bureau of labor statistics began to collect data. It almost at once became apparent that the then standard method of presenting the facts by means of frequency of accident occurrence did not by any means tell the whole story and did not always tell an accurate story. When there are combined in a single group items as different as cases involving a single day of disability and other cases involving absence from work for a year the opportunities for error are very great.

To meet this difficulty the bureau began to experiment with rates which should be based on the severity of the accidents rather than on their frequency. The final outcome of this experimentation and prolonged discussion was the adoption by the International Association of Industrial Accident Boards and Commissions of a scale of weighting by which the dissimilar elements of accident occurrence may be reduced to common terms. The first extended application of this system of severity rating was made in the iron and steel industry.

When the results of applying the method became evident it appeared that severity rating disclosed a much higher degree of importance for death and serious mutilations than had been realized. The study of death further disclosed that serious accidents were in large measure due to failure to apply engineering knowledge to the problem. This directed attention anew to those changes embraced under the expression "engineering revision."

It may be said, therefore, that historically the iron and steel industry has made five outstanding contributions to the safety movement.

1. The industry, represented by the Steel corporation, initiated the movement.
2. It established the committee system.
3. It made the first large trial of compensation.
4. Through the Association of Iron and Steel Electrical Engineers it laid the foundation of the National Safety council.
5. It has directed attention in a new way to the importance of the engineering factor in accident prevention.

What has been the outcome of the effort which has built up the present extended organization? It would be perfectly possible to develop an organization and make a brave showing of interest and progress when the real object was far from being attained.

It may be said at once that the ordinary expression of success, namely, such and such percentages of decreased accident occurrence, are apt to be quite misleading. Nothing is more striking than the decline of minor injury which can be secured by certain kinds of appeal to the men. They respond remarkably and to outward appearance success has been very great when closer analysis may often show the old stubborn difficulties scarcely touched.

It is only by maintaining a continuous record for a considerable period and massing a sufficient body of data that it is possible to secure dependable results. The industry now has more than a decade of such records.

Improvement in 17 Departments

If the five-year period from 1910 to 1914 be compared with the five years, 1915 to 1919, it will be found that the industry considered as a whole showed a frequency in the first period of 59.2 per 1,000,000-hours exposure and in the second of 41.6. In severity the record is 4.1 and 3.6, respectively.

These are substantial and considerable decreases. They represent both a sufficient exposure and a period of time such that the indications may be accepted as reliable. Some of the more important departments show such severity records as the following: Blast furnaces 1910-14, 7.0 and 1915 to 1919, 6.1; open hearths 6.6 and 6.5; sheet mills 2.6 and 1.5; mechanical 4.0 and 3.5.

It must not be forgotten that these lower severities for the second five-year period were secured under the enormous stress and difficulty of the world war. When the war years are examined in detail it is found that they present a picture of rising accident rates but, for the most part, these rates did not rise so high as in the period of industrial activity immediately preceding the war.

The pictures presented by the several departments are not all thus satisfactory. For example, the bessemer department while making a frequency reduction, 89.8 to 57.7, has severity rates of 6.4 and 6.9 in the two periods. The electrical department has a small decline in frequency, 47.1 to 40.3, but severity goes from 6.3 to 7.2. This is distinctly a disappointment since individual plants have shown that the electrical department can be conducted with much greater safety if due attention is given to it.

The most hazardous employment in which men engage, namely, the erection of structural steel, shows a very interesting improvement. Severity drops from 31.4 to 22.3 when the second period is compared with the first. The exposure is, however, rather small as a basis for a positive conclusion. There is enough, however, in this and other compilations bearing on the hazard of building operations to indicate a very hopeful field of safety effort.

Betterment Is Noted

When 25 departments which can be compared for the five-year periods 1910 to 1914 and 1915 to 1919 are considered it is found that 17 register an improvement while eight show a less satisfactory condition.

When the causes of accidents are subjected to critical study it appears that the results of effort show a well-balanced effect. The results secured have not come about by excessive attention to some easily controlled cause or group of causes.

The study of the nature, anatomical location and results of injury leads to the conclusion that a very pervasive force has been operative tending steadily toward a lowered accident rate. This may be taken as evidence of the general soundness and efficiency of the safety program.

It is interesting to look into the future and see the ultimate result of the forces and activities with which experiment has been undertaken. Recent years, however, have been so disturbed industrially that

it is difficult to isolate the permanent factors of the situation from those of merely transient significance.

First, it may be said that the day of spectacular accident reduction in large industrial groups is practically over. Individual plants in which standard practice is introduced will still make records, but the present trend of events is toward a slow decline with fluctuations corresponding to the variation of industrial condition.

The great variable in the accident record is the number of cases of minor injury. Once these are under control and reduced, as they may easily be, from 50 per cent upwards, further progress will necessarily be slower. The standard illustration of the extreme possibilities of minor injury reduction is the experience of a large group of plants in which a foreman's accident reduction bonus was in effect. Under the conditions prevalent before safety activity began 50 per cent or more of the accidents were such as to cause disability of one week or less. About 25 per cent of the disabilities terminated in the second week. Immediately on the establishment of the foreman's bonus minor injuries began to decrease in a surprising manner. The number terminating in the first week steadily and rapidly declined until finally they were less in number than those terminating in the second week. This is entirely contrary to established opinion. It has been accepted without question that these minor injuries were due to the careless habits of the workers and that they would be hard to eradicate. Experience now demonstrates that this class of injuries is the easiest of all to control.

Second, with a clearer view of the importance of the engineering factor a progressive though probably slow decline in the severity of accidents may be expected. The importance of eliminating minor injury to the greatest possible degree is very great. It has an excellent effect on the morale of the working force. The results of effort in that direction can easily be displayed and made intelligible. All such considerations enforce the importance of efforts directed toward eradication of minor injury. However, the serious problem which now confronts the safety movement is the control of the severer forms of injury.

In Bulletin 198 of the bureau of labor statistics the severity of accidents is charted in various relations. The bars of which these charts consist have three portions, a black portion representing fatality, a shaded portion representing permanent disability, and a white portion representing temporary disability. In almost every instance the black portion of the bar is the large and conspicuous element. This means that when the various kinds of accident are weighted in some reasonable relation to their importance, death is shown to be conspicuously the most important. Death is the dark shadow in the field of accident prevention.

Third, as the relative seriousness of fatal injury becomes more evident there will be a renewed study of the causes and remedies of this class of accidents. It is one of the chief merits of severity rating that it does throw up in true proportions the importance of death. Under ordinary conditions even in the most hazardous industries death is comparatively rare and if judgment is based on this rarity rather than on the seriousness of the occurrence such judgment is likely to be much in error.

Fourth, if the movement is to progress satisfactorily a more thorough study of death cases must result in further reconstructions and rearrangements as radical as any which have hitherto been attempted. A broad and intensive application of engineering skill of the highest order must be demanded.

Seek New Data on Blast Furnace Operation

What goes on inside the modern blast furnace while in operation is being made the object of a number of interesting investigations under the direction of the United States bureau of mines which is essaying entrance into the field of practical metallurgy. The bureau, as announced by F. W. Davis, of the bureau, before the recent meeting at Ironton, O., of the Southern Ohio Pig Iron and Coke association is just completing at Minneapolis, Minn., a small blast furnace 14 feet high with 19-inch hearth, which will be ready to blow in late this month for a 30-day campaign. It has a skip hoist, one stove for calorizing the blast, one large tuyere and two small ones, and two cinder notches. It will use some of the low grade ores of Minnesota for experimental reasons. The 13-inch hearth furnace previously used in the Minneapolis experiments made a little iron, about the grade of a fair spiegeleisen. This new furnace is to run for several days to develop slag and gas tests, and later for experiments in oxidization or reduction temperatures.

Some time in October the bureau will avail itself of an invitation from the American Rolling Mill Co., Middletown, O., to conduct tests at the company's Columbus, O., blast furnaces to ascertain the temperature of gases at the tuyere line the composition of these gases, especially with reference to reduction, etc.

Some time ago such a series of experiments was made under the direction of the bureau in a Birmingham, Ala., stack which were not so ambitiously carried on. However, by means of water-cooled instruments samples of hot gases were obtained from the interior of the stack through the tuyeres which showed 55 to 60 per cent of these gases were composed of CO (carbon monoxide). But not a great deal of attention was paid to temperatures.

Study Effect of Arsenic in Iron Ore

The problem of arsenic in iron ore frequently puzzles producers and users of ore. Fred Clements, chief engineer, Park Gate Iron & Steel Co., Ltd., Rotherham, England, comments on the subject as follows:

"With regard to the main question I think it can be taken that arsenic in small quantities has no marked influence on iron and steel. It is probably frequently present in minute quantities, and as the usual chemical tests for phosphorus show arsenic as phosphorus it usually passes unnoticed. Presuming the ore contains about 50 per cent metallic iron along with 0.06 per cent arsenic, then unless some preparatory treatment is given to the ore the whole of the arsenic will be reduced into the metal and will give about .12 per cent in the pig iron. There would be marked objection on the part of customers to this percentage of arsenic although that objection probably would be based largely on the fact that they had not used it before rather than on any marked knowledge of what the effect may be. The compounds of arsenic with iron form an eutectic with a freezing point of 830 degrees Cent. This low freezing temperature would tend to cause hot brittleness in the material but to what extent this may appear would have to be the subject of experimental investigation. If the iron is used for steelmaking then on the usual proportion of 50 per cent scrap and 50 per cent pig iron the content of arsenic in the steel would probably be about .06 per cent. As far as investigation goes at present, this amount of arsenic would cause no ill effect but on the other hand its presence does not materially increase any useful property of the material. From tests which have been made arsenic content up to 1 per cent in the steel is negligible as regards making steel brittle."

"With regard to the treatment of the ore for the removal of arsenic, it depends to a large extent upon the combination in which the arsenic exists in the material. As it very probably exists as arsenic trioxide this would be susceptible to heat and, if for any other reason it was necessary to calcine the ore, the arsenic would be volatilized and pass away with the fumes. As previously intimated if the ore is charged into the furnace without any previous treatment then, owing to the reducing atmosphere, there seems to be nothing to prevent the whole of the arsenic appearing in the pig iron."

(*Concluded from Page 718*)

Trace Electrification

little loss, but we also know that with the piping systems as existing in our mills, even when good maintenance is a rule, the losses are extremely high. It is seldom that after taking into consideration the output of the different mills, etc., and making what appear to be extremely liberal allowances for the steam consumption of individual units that we can account for more than approximately 50 per cent of the steam generated. Where it goes to may seem at times mysterious, but a few simple tests usually indicate the vast losses of the piping system which are incomparably higher than the theoretical figures that might be obtained for the system.

Regarding steam piping, if it is installed overhead the expense of protecting and maintaining the insulation is serious if it is to be done efficiently. If it is installed in a trench the first cost will be high if proper provision is made to insure drainage and accessibility. If it is installed in a tunnel it can readily be maintained and kept properly insulated, but the cost of such a system is a factor.

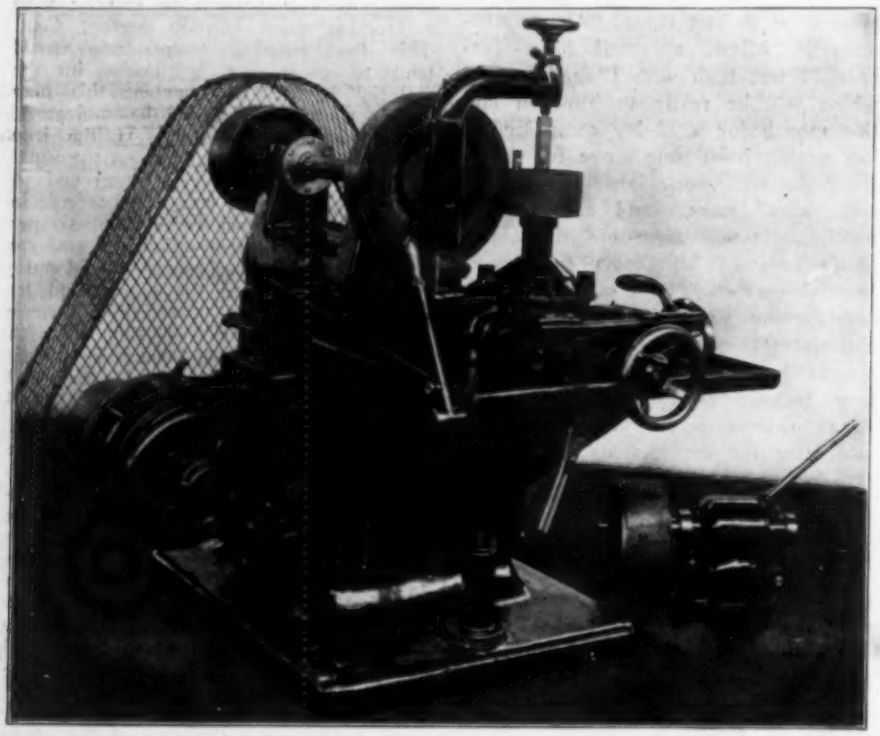
Attention might be drawn to the fact that it is usually almost impossible to obtain any consistent or reliable data as to steam distribution in our mills. This is probably due to the fact that the steam engineer has to account in some way for the steam generated, and after making, what he feels is a liberal estimate, he finds he is so far away from the actual consumption that the imagination must be brought into play and the less definite figures are given the less trouble there will be in explaining any discrepancies which there may be.

Regarding engines for driving mills, all mills run a considerable part of the time on friction load, and the economy of an engine is usually poor under such conditions. It is absolutely misleading to talk about a full load steam consumption and so many pounds per horsepower, as mill loads fluctuate so greatly that actual consumption will be much more than will be indicated by the full load figures. We cannot consider the engine alone as we can a motor as the standby and distributive losses of the lines is such a serious factor that the only basis on which comparisons can be made is the amount of fuel expressed either in tons of coal or B.t.u.'s required for power purposes in the plant as a whole. In the case of a motor we can measure definitely how many kilowatt hours it uses and as our generating stations can be treated as an independent manufacturing unit, knowing the number of kilowatt hours used, we can determine the exact cost, to the simplicity and accuracy of the measuring devices we can add up the readings of the meters on the individual consuming units at the end of the month and know that it will check closely with the totalizing meter of the generating station, which is certainly not the case with any of the various measuring devices available for steam installation.

Stated briefly, the facts are as follows: The use of steam drive generally involves us in long steam lines or in a multiplicity of boiler plants, both of which are inherently uneconomical from a practical standpoint. In the case of electric drive we can locate our boiler and power plants in relation to fuel and water supply without any consideration as to mill location, as distributive losses only occur when the lines are loaded and seldom exceed at the maximum 1 to 2 per cent.

Electrification Offers Economy

In the case of steam-driven mills the power unit utilizing the steam is inherently a less economical machine than the modern turbogenerator units, even under the best conditions of load, but due to mill conditions the economy is much inferior from a practical standpoint. The one factor that adds greatly to the economy of the electric system is the advantages to be gained from the centralization of power generation. We can so arrange the number of units carrying the load that they work at a high average economy. We can add or take off units as the total load fluctuates, and maintain practically the same economy whether the station is running on Sunday load or at its full capacity. We achieve a great economy due to the diversity factor of the individual units, which if we drive by individual prime movers we lose entirely.

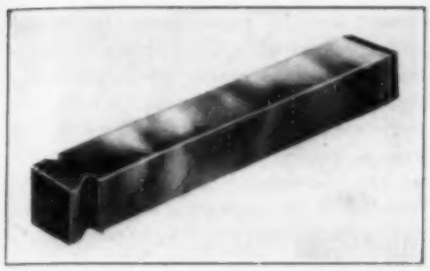


GRINDER BUILT FOR PRODUCING CONVEX, FLAT OR CONCAVE FACES ON PULLEYS, WHEELS AND ROLLERS

Designs New Machine for Pulley Grinding

To produce with great speed convex, flat or concave faces on pulleys, wheels, rollers, etc., the Diamond Machine Co., Providence, R. I., has developed a new type grinding machine. This machine, which is shown in the accompanying illustration, also will face edges through the means of an attachment. The advantages claimed for the grinder are that the metal is cut at the rate of about 300 linear feet per minute, less finish is required on the castings since grinding will remove hard scale and a smooth finished surface is obtained. A crowned rather than an apex surface is secured and a semipolished surface is attained without difficulty. The fixtures which are provided are arranged for rapid setting up and taking down of the work.

The machine weighs approximately 2000 pounds and occupies a space 3 feet 6 inches by 4 feet 6 inches on the floor. Cutting speeds may be varied by chang-



THIS SELF-FITTING KEY IS DRIVEN INTO THE KEYWAY WITH A HAMMER

ing the back gears. Power is supplied by a 10-horsepower motor running 1800 revolutions per minute with a silent chain drive to the spindle, the spindle speed being 1500 revolutions per minute. A chuck 15 inches outside diameter with a 14-inch abrasive wheel of 1-inch face constitutes the grinding unit. The height of the spindle from the floor is 44 inches. For wet grinding the machine is provided with a vertical spindle pump with an adjustable spray nozzle and ample passages to the sediment tanks.

For edge facing a simple and substantial attachment weighing about 50 pounds is used, only a few minutes being required to place it in position. Heavy permanent dowels as well as large holding down screws prevent misalignment of the machine. Pulleys or other similar castings ranging from 2 to 18 inches in diameter with faces from 1 to 6 inches in width may be ground.

New Type Key Is Made Self Fitting

In fitting keys in keyways in shafts, couplings, gears, sprockets, pulleys, etc., usually it is necessary to fit the parts together by hand to obtain the desired tightness. To eliminate this filing or scraping operation, Smith & Serrell, Newark, N. J., are introducing a self-fitting key. This key, which is shown in the accompanying illustration, is made from a tough chisel stock and is ground to a size slightly larger than the nominal keyway width. A hardened cutting edge and chip recess are provided near the front end of the key and ahead of these is a pilot slightly smaller than the keyway width.

To install one of the keys the pilot is entered first with the cutting edge at the side. Then the key is driven in with an ordinary machinist's hammer or with a sledge, depending upon the size of the key. The cutting edge or edges sizes the keyways to make a tight fit between the body of the key and the keyways. In the smaller sizes cutting edges are provided only on one side but in the larger sizes, cutting edges sometimes are placed on both sides. When it is desired to fit the top and bottom as well as the sides, a cutting edge is provided at the top.

Will Dedicate Tablet To Converter Pioneers

One of the features of the coming convention and exhibition of the American Society for Steel Treating at Detroit, Oct. 2-7, will be the unveiling of a bronze tablet dedicated to the memory of those pioneers of the steel industry who in 1864 erected at Wyandotte, Mich., the first bessemer converter used commercially for the manufacture of bessemer steel in America. This tablet is to be erected by the Detroit chapter of the society through its executive committee acting as a special committee.

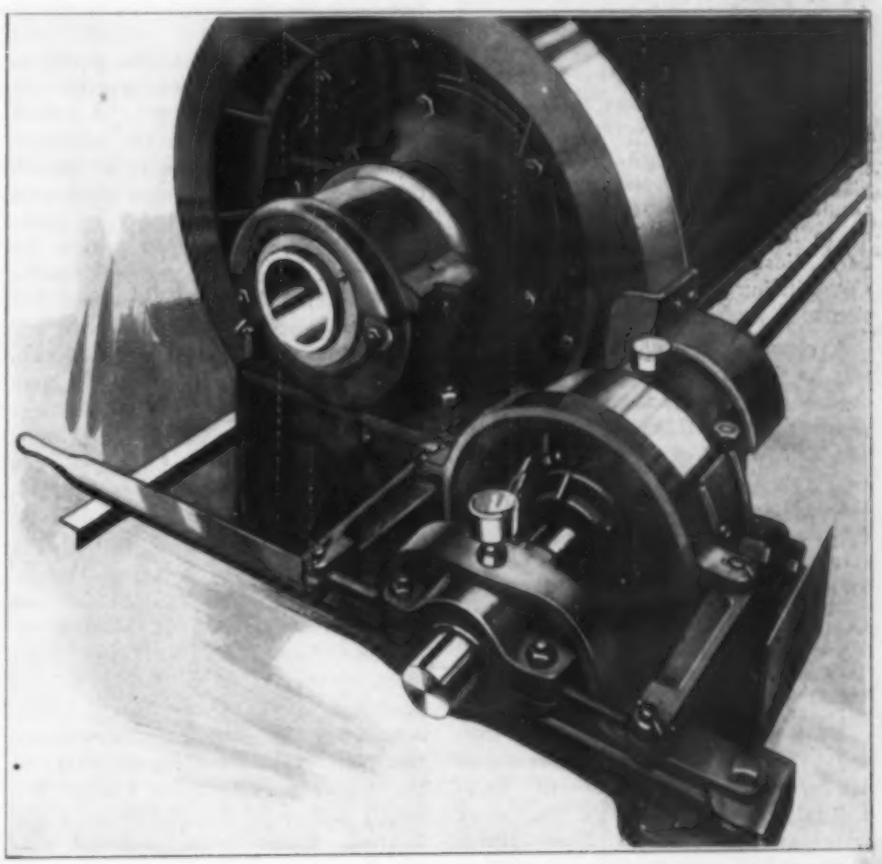
The site of the Wyandotte Iron Works where William Kelly's first tilting bessemer steel converter was erected is the present location of the Wyandotte public library. Permission has been secured from the library board for placing this tablet on the front of the building. The tablet will be 24 x 36 inches and at the head will be a bass relief of the original converter. The unveiling exercises probably will be held on Thursday afternoon, Oct. 5. The governor of Michigan and other prominent speakers are expected to attend.

It is interesting to note that the erection of this tablet is the first public recognition of the achievements of William Kelly who made his first bessemer steel in 1847, finally patenting his process in 1856. However, it was not until eight years later that the Wyandotte Iron Works produced the first bessemer steel for commercial purposes.

Devise Clutch and Brake for Tumbling Mills

One of the latest developments in safety equipment for foundries and shops is the introduction of a combination clutch and brake mechanism for tumbling mills by the Whiting Corp., Harvey, Ill. This device, as shown in the accompanying illustration, is simply constructed and its operation is controlled by a hand lever. Shifting this lever toward the mill engages the clutch and starts the mill. To stop the mill, the lever is moved in a reverse direction, passing through neutral to the braking position.

Several advantages are claimed for the new mechanism. A loaded mill can be brought to a rest at the proper point for unloading without loss of time. This eliminates the necessity of holding the mill in place with a wooden prop or a bolt thrust into the gearing, a practice which is dangerous. With the combination clutch and brake, it is said to be impossible for the barrel to turn after the brake is set even though the barrel is loaded unequally.



THIS COMBINATION CLUTCH AND BRAKE FOR TUMBLING MILLS MAKES OPERATION SAFE

Chemical Meeting

At Pittsburgh Ends With Inspection Trip—Education Emphasized

Pittsburgh, Sept. 12.—With an excursion to the Clairton by-product coke plant of the Carnegie Steel Co., and to the Monongahela, Pa., plant of the American Window Glass Co., last Friday the sixty-fourth annual convention of the American Chemical society practically was brought to a close. More than 900 of the 1400 visiting delegates took the trip.

Profs. Ralph H. McKee and Stephen P. Burke of Columbia university described a new process for making alcohol from natural gas during the sessions. It was explained that natural gas mixed with steam and passed over slaked lime at a temperature of 375 degrees Cent. would give a product containing 90 per cent alcohol. These experiments were taken up looking toward the conservation of forests.

Jacob Gornoz, Edward Ellery and Edward Bartow urged more attention to be paid to educating chemists for industrial work and John A. Matthews and Elton R. Darling read papers on iron making in the colonial days and the development of the bromide industry.

Wednesday a resolution in favor of the adoption of the metric system for the United States was adopted practically unanimously at a national conference participated in by 25 organizations. Opposition was furnished by representatives of several manufacturers who believed a sudden change in the system of measurements would result in such expense and confusion as to be impracticable. S. M. Kintner, Westinghouse Electric & Mfg. Co., Pittsburgh spoke against the motion.

A chemical development that promises to increase the efficiency of gas engine operation was described in a paper read by Thomas Midgley Jr., and T. A. Boyd of the General Motors Research Corp., Dayton, O. Several chemical compounds have been developed which will accomplish these results. These compounds have not yet been placed on the market, Mr Midgley said, as the full benefit cannot be derived from them until gas engines have been redesigned to operate at higher compression.

Most sessions were held at the Carnegie Music Hall and in various rooms at the Carnegie Institute of Technology. Headquarters for the week were at the William Penn Hotel. Next spring's meeting is to be held at New Haven, Conn., in April and next fall's gathering at Milwaukee in September.

Various group meetings were held by the different chemical divisions including industrial and engineering chemistry; gas and fuel division, petroleum, agriculture and food, biological, fertilizers, cellulose, sugar, medical products, rubber sewerage, water and sanitation and dyes.

British Engineers Form New Joint Council

New York, Sept. 12.—Engineering societies of England have formed the Engineering Joint council, according to a message received from M. Mowat of London, secretary, British Institution of Mechanical Engineers by Charles F. Rand, chairman of the Engineering Foundation of New York. The Engineering Joint council will cooperate with the engineers of the United States and Canada and all other British possessions to bring about concerted action for world peace and the advancement of engineering ideals. Mr. Rand alludes to the organization of British engineering bodies into a single unit as a step forward in the movement to form a world movement of engineers which already has gained headway in France, Italy and Czecholovakia, direct contacts having been established by the engineering bodies of those countries with those of America. Formation of the British Engineering Joint council, according to Mr. Rand, is one of the results of the trip abroad of a mission of 13 American engineers headed by Ambrose Swasey to confer the John Fritz gold medal upon Sir Robert Hadfield of England and Eugene Schneider of Paris. The organization represented on the council includes the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Institution of Naval Architects and the Institution of Electrical Engineers.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

TO ENCOURAGE the presentation of high grade papers, the American Society for Steel Treating has announced the establishment of a Henry Marion Howe medal, this medal to be presented each year to the author of the paper of highest merit on any subject within the field of the society. A fund known as the Henry Marion Howe fund has been set aside and the proceeds will be used to apply on the gold medal.

Arrangements have been completed whereby a meeting of the Drop Forge Supply association will be held during the international steel exposition and convention of the American Society for Steel Treating and the American Drop Forging institute in the General Motors building, Detroit, Oct. 2-7. The meeting will be held in the same building at 12:30 p. m. Tuesday, Oct. 3. H. N. Taylor, president of the N. & G. Taylor Co., is president of the Drop Forge Supply association It has been announced also that committee *A*-1 on Steel of the American Society for Testing Materials will meet Oct. 5 and 6. F. M. Waring, Pennsylvania Railroad Co., Altoona, Pa., chairman of the committee *A*-1 will be in charge of the meetings which will be held at the Statler hotel. A number of subcommittee meetings have been scheduled.

Announcement has just been made that Prof. Henri Le Chatelier, Paris, has been made an honorary member of the American Society for Steel Treating. Professor Le Chatelier is known in metallurgical circles as the inventor of the thermocouple.

Convention Calendar

Sept. 11-15—Association of Iron and Steel Electrical Engineers, 1922 convention at the new auditorium, Cleveland. John F. Kelly, Empire building, Pittsburgh, is secretary.

Sept. 21-23—American Electrochemical society, fall meeting at the Windsor hotel, Montreal, Canada. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Sept. 23-28—National Association of Cost Accountants third international conference to be held at Atlantic City, N. J. Stuart McLeod, 130 West Forty-second street, New York, is secretary.

Sept. 25-29—American Institute of Mining and Metallurgical Engineers, 126th annual meeting at San Francisco. Frederick F. Sharples, 29 West Thirty-ninth street, New York, is secretary.

Oct. 2-7—American Society for Steel Treating, exposition and convention at the General Motors Co. building, Detroit. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Oct. 18-20—Society of Industrial Engineers, national convention and exhibition at the McAlpin hotel, New York. George C. Dent, 327 South La Salle street, Chicago, is business manager.

Coal Trade Inquiry Is Assured

President also To Sign Bill for Federal Fuel Distribution—No Interference in Movement to Industries Expected—Hoover Outlines Suggestions for Permanent Settlement—Danger of Car Shortage Increases

WASHINGTON, Sept. 12.—Differences between the senate and the house over the two coal measures, the one setting up a federal fuel distributor and providing for distribution and for safeguarding against profiteering, and the other authorizing an investigation of the industry by a federal commission, have been adjusted and the measures are certain to receive the President's signature. The President is expected immediately to name the commission, which will make separate investigations of the bituminous and anthracite divisions, reporting on that of anthracite no later than July 1 and on the bituminous within five months, or by March 1.

Whether a federal fuel distributor is named at this time and the interstate commerce commission wields its added authority to withhold empty coal cars from profiteering operators and speculators is not certain. It seems probable, in any event, that the movement of bituminous to industries will not be further interfered with. Significant of the temper with which congress regards the coal industry is the fact that 30 of the 49 senators voting on the commission bill refused to strike out provisions calling for an investigation into the wisdom of practicability of nationalization.

Secretary Hoover's belief that increased production of bituminous coal would result in self-stabilization of that industry apparently is being borne out. The reports filtering into Washington tell of decreasing prices. With Labor Day past, production is expected to pick up and top the 10,000,000-ton mark weekly. Fuel Distributor Spencer has been compelled, however, to have his agent at Cleveland issue class No. 1 priority orders to bring the Great Lakes movement up to the schedule of 1,000,000 tons weekly. The movement last week is estimated at only 600,000 tons.

Some emergency requirements of gas plants and of some industries in the Southeast are being met by emergency orders, but beyond this the fuel distribution machinery is not functioning. The National Sand and Gravel Producers' association has asked for further modification of service order No. 23, to make more open-top cars available for the transportation of road material, and a hearing has been granted by the commerce commission on Sept. 21.

The railroad strike is regarded here as being as good as settled. There is, however, an added danger of car shortage. Railroad loadings are normally the heaviest of the year in September and October, and in addition the carriers this year will have the backlog of fuel requirements to carry. The surplus of serviceable freight cars is rapidly melting away. The present trend indicates a shortage of cars by the end of September. A statement by the Association of Railway Executives says that from Jan. 1 to Aug. 1 this year the railroads had 25,763 more new cars either ordered and under construction or installed in actual service than during the entire year 1921. In this seven month period orders or installations totaled 95,199, against 69,436 in all of 1921. Of the 95,199 cars, coal cars accounted for 41,405.

The investigation of the coal industry to be undertaken by the commission to be appointed by the President, the report of which should be available prior to the termination of the new wage contracts, makes unnecessary the probe threatened by Secretary Hoover. In an address delivered tonight in New York city Secretary Hoover expressed himself as follows concerning the coal situation:

"Aside from relief from national stoppage in production from strikes and lockouts, there are proposals of constructive and practical remedies which should be investigated and which do not lead to socialism and destruction of the American freedom and initiative. For instance, an extra annual storage of 20 per cent of railway consumption would equalize the seasonal fluctuation. Larger storage is possible by the railways at those times when public demand for coal is slack instead of competition by the railways themselves with the public for coal, and thus for the use of cars, at the annual period of car shortage. A system of car distribution that would not itself break into regular operation would help. Larger storage by public utilities would assist and would give greater security to the public.

"A contributing remedy that will need the most earnest consideration is the possibility of permitting the co-operative system of marketing developed by the farmers to be applied by such mines as wish to adopt it, under circumstances that would assure competitive conditions. Such an arrangement would decrease distribution costs, would give more regular flow to orders, would get better car distribution, would decrease transportation would enable the laying down of coal in storage at points of consumption, and would consequently give more regular operation with reduced working costs. More accurate statistics of capacity, production, consumption stocks, and prices would greatly promote stability and would be in the true interest of the operators who are now blamed for much that is not their fault.

"It has also been proposed, although I have doubt as to practicability, that there should be a penalty in higher wages for short-time employment. Proposals are also made for a basic wage with a participation in the realized price of coal.

"Of dominant importance is the fact that the whole employe and employer relationship requires reform if we are to secure a stable industry. Much friction would of course disappear if there were less intermittence. The instability of these employment relations themselves form a vicious circle of quarrels. Collective bargaining has a fundamental value in the industry in the maintenance of standards of wages and conditions of labor, for otherwise the workers, because of competitive drive for low costs, would never have arisen from the impossible conditions of years ago; but the breakdown of true collective bargaining in the biennial conflict, the constant local violation of agreements, and the multitude of small strikes are themselves proofs that it needs better organization, and public participation with guarantees.

"I recognize that stabilization of the industry, or anything that lends stability to the industry, is opposed by a small minority of speculative operators who use the periodically disturbed production to reap a recurrent harvest. It would be opposed on the other side by some of the more narrow-minded labor leaders who contend that their object in all industry is to reduce the number of hours of actual labor to some minor fraction of the whole year, or whose ambition is to drive the nation to socialism in desperation for coal, or who deny the public right to any voice. However, I believe that the constructive men on both sides are in full agreement that we must have a broader and better solution than results from the truces of the past few years.

"These periodic wars in the industry are, therefore, in part symptoms of a disease. But before we treat this disease we must have a more accurate diagnosis. We must have adequate, accurate information from which to weigh the different causes. We must be able to apply to all the test of fact. From such an understanding we should be able to return this industry to sanity. The proposed commission has the greatest opportunity for constructive work since the war. The public demands results; it is sick and weary of periodic warfare and futile attempts at solution."

Crucible Announces New Stock Offering

The directors of the Crucible Steel Co. of America have announced their decision to offer 50,000 shares of common stock for sale at not less than $100 a share to holders of the company's preferred and common stocks of record Sept. 11. H. S. Wilkinson, chairman of the company, in a letter addressed to its shareholders explained details of the plan.

Stockholders of record Sept. 11 will receive warrants of rights to subscribe to the new stock at the rate of one share of new stock for each 15 shares of preferred and common stock held.

The new issue has been underwritten at $100 a share. The present open market value of Crucible common stock is now around 95. The sale of the stock will increase the amount of the company's common stock outstanding from $50,000,000 to $55,000,000 out of an authorized issue of $75,000,000 common. In addition there is $25,000,000 preferred stock outstanding.

"The object of this action by the board of directors," said Mr. Wilkinson, "is to provide the company with $5,000,000 of additional cash working capital. None of this additional working capital is intended to be used for the extension of the present plants of the company or for the acquisition of additional plants. The additional cash capital is proposed to be used to meet the requirements of the increasing volume of operations due to the gradual resumption of normal business."

American Brake Shoe Buys Additional Plants

The Ramapo Iron Works, with plants at Hillburn and Niagara Falls, N. Y., and Niagara Falls, Ont., and the Ajax Forge Co., with plants at Chicago and Superior, Wis., have been purchased by the American Brake Shoe & Foundry Co. A new corporation, the Ramapo Ajax Corp., will hold the assets of the acquired companies. To finance the purchase, announcement is made of an offering of $2,250,000 of first mortgage 20 years, 6 per cent, sinking fund gold bonds of the Ramapo Ajax Corp. which will be offered for public subscription at par.

The bonds are redeemable in whole or part on any interest date for the purpose of the sinking fund after Sept. 1, 1924, and at the option of the company on and after Sept. 1, 1923, the redemption price to be 105 up to and including Sept. 1, 1932, and thereafter at a premium equal to one-half per cent. for each year to maturity. Provision is made for a semiannual sinking fund that will retire $1,000,000 principal amount of these bonds by maturity.

The American Brake Shoe & Foundry Co. covenants in the mortgage to retain control of the new company as long as any of the bonds are outstanding. The acquired corporations have been in business since 1883 and manufacture railway track material as well as industrial cars and car equipment.

Rebuilt Muck Bar Plant To Operate Soon

Reconstruction of the plant of the Sligo Iron & Steel Co., Connellsville, Pa., by the Lockhart Iron & Steel Co., Pittsburgh, now is practically complete and production of much bar will be inaugurated shortly. The rebuilt plant will have a capacity for producing about 22,000 tons of muck bars a year. The muck bar will be shipped direct to the McKees Rocks plant of the Lockhart Iron & Steel Co., to be converted into finished products. Announcement of the company's plans was made yesterday by T. J. Gillespie Jr., secretary-treasurer.

Reconstruction of the Sligo plant has been carried on under the supervision of J. Porter Gillespie, who will manage the new mills and their operations. The plant will include 20 puddling furnaces, with a new traveling crane and other modern equipment. The new mills cover ground on which was erected one of the first iron manufacturers west of the Allegheny mountains. In more recent years, the old Sligo Iron company of Soho, Pittsburgh, moved to this site, and there operated for some time. After a period of idleness, New York capital revived the activities of the latter company during and after the war.

Competent Labor Rate Raised to 35 Cents

Waterbury, Conn., Sept. 12.—An advance of 5 cents an hour in the rate of pay for so-called "competent" common labor was announced Sept. 8, as effective at once by the Scovill Mfg. Co., the Chase Metal Co., the Chase Rolling Mills and the American Brass Co., of Waterbury, Conn. In the case of the latter company the advance applies to the same class of labor at its plants in Ansonia and Torrington as well as Waterbury.

Since the latter part of 1920 the rate has been 30 cents an hour, but it is said the business depression resulted in such large removals from the Naugatuck valley that recently the various nonferrous plants have been bidding against each other with the result that the 35-cent scale has been "unofficially" in effect for some time. The Chase interests in making public the advance state that "this advance will naturally be followed by similar advances in the hiring rates of other types of labor at their plants."

France Increases Exports and Imports

Washington, Sept. 12.—During the first six months of 1922, according to information received by the department of commerce from Acting Commercial Attache Butler, Paris, French exports of iron ore reached 4,328,455 metric tons, value 99,000,000 francs, as against 2,666,428 tons, value 61,000,000 francs, during the first six months of 1921. Germany's exports of iron ore increased from 505,702 tons to 1,160,058 tons. Increases also are shown for the Saar and the Netherlands.

The total French imports for the first half of 1922 of pig iron, wrought iron and steel, including slag, amounted to 391,574 metric tons, value 293,000,000 francs, against 251,232 tons, value 269,000,000 francs, during the corresponding period of 1921. The increase in imports is especially notable for foundry pig iron, 34,848 tons during the first six months of 1922, against 15,281 tons during the same period of 1921; for blooms, billets and bars, 160,931 tons against 90,072 tons; for hoop iron or steel, 19,406 tons against 8388 tons; for hot-rolled bands, or large plates, 10,036 tons against 6374 tons; and for tinned sheet iron, 23,216 tons against 7511 tons. The French imports of scrap iron, axles, and tires decreased.

Exports of metallurgical products amounted to 1,274,095 tons, value 427,000,000 francs, during the first six months of 1922, against 968,766 tons, value 359,000,000 francs, for the same period of 1921. The principal increases were in semifinished products, 356,570 tons in 1922 against 240,078 tons in 1921; machine iron, 9155 tons against 411 tons; waste and scrap iron and steel, 460,487 tons against 234,505 tons. There were decreases for foundry pig iron, 246,530 tons against 315,809 tons and for iron alloys and iron or steel wire.

Locomotive Output Less

United States census bureau reports on the locomotive industry reveal a marked decrease in 1921 from 1919. The number of establishments in the United States increased from 17 in 1919 to 19 in 1921. However, the number of employes decreased from 28,743 in 1919 to 17,981 in 1921, the cost of material used fell from $72,375,950 to $48,283,655, the value of products declined from $156,269,730 to $100,244,518, and the value added by manufacture dropped back from $83,893,780 to $51,972,295. The number of steam locomotives manufactured in 1921 was 2031 valued at $78,271,128.

Wages of the rivermen employed by the Carnegie Steel Co. have been advanced 10 per cent, making the rate almost as high as that paid during the war.

Steel Merger Is Not Condemned

In Issuance of Complaint, "Federal Trade Commission Expresses No Final Judgment as To Legality," Victor Murdock, Acting Chairman, Explains to Senate— Date for Public Hearings To Be Set Soon

WASHINGTON, Sept. 12.—Victor Murdock, acting chairman of the federal trade commission, in a communication to the senate informing it of the issuance of the commission's complaint in the Midvale-Republic-Inland steel merger case, has taken pains to emphasize that the complaint by no means condemns the proposed merger. This attitude is a further outcropping of the division within the commission over the issuance of the complaint, which prompted Chairman Gaskill and Commissioner Van Fleet to issue biting and opposing statements explaining their stands.

The filing of answers by the three defendant companies to the charge that their consolidation gives evidence of being an unfair method of competition in violation of the federal trade act, is the next step in the proceeding. Then will follow a public hearing. It is probable that the commission will shortly announce the date for beginning the hearing in the Bethlehem-Lackawanna case. While the commission's attack upon both mergers is based on the same ground and the evidence in both cases broadly will be similar, no steps have been taken looking toward a consolidation. Commissioner Murdock's communication to the senate, informing it of the commission's action, which was the upshot of the LaFollette resolution, is as follows:

"By resolution No. 286 agreed to on May 12, 1922, the attorney general of the United States and the federal trade commission were requested to inform the senate what steps had been taken or they proposed to take, to ascertain the purpose and probable effects of the proposed merger of certain steel companies therein named; to inform the senate as to results of any investigations which they may have conducted and what actions they have instituted to protect the public interest.

"Pursuant to this resolution the federal trade commission reported to you on June 5, 1922, that it had reason to believe that the proposed merger of the Bethlehem Steel Corp. and the Lackawanna Steel Co. was in violation of the federal trade commission law, and that a proceeding by this commission in respect thereof would be in the public interest, wherefore this commission had issued its complaint directed to those two companies, stating the commission's charges as prescribed by statute.

"As to the proposed combination of Midvale Steel & Ordnance Co., Republic Iron & Steel Co. and Inland Steel Co., the federal trade commission reported to you that the proceedings have not developed sufficiently to enable the federal trade commission to arrive at a conclusion and it was stated that a further report would be made in response to the resolution of the senate at some subsequent time.

"The deails of the plans of the three companies have been developed by them and ascertained by the federal trade commission; additional information has been sought and obtained until this commission is in position to make that preliminary determination which is a part of its prescribed procedure. A majority of the members of the commission having reason to believe that the proposed and pending combination of these three companies is in violation of the federal trade commission law, and that a proceeding by this commission with respect thereof would be in the public interest, has issued a complaint to Midvale Steel & Ordnance Co., Republic Iron & Steel Co. and Inland Steel Co. stating its charges in that regard.

"Of course, the issue of the complaint is merely the institution of formal proceedings to test the legality of the proposed merger. In the ordinary course answer will be filed to this complaint and testimony will be taken both on behalf of the government and of the three steel companies. At the conclusion of this testimony and after argument the commission will determine the facts and apply the law thereto. And only if such a conclusion is justified by the facts will an order to cease and desist from the proposed merger be issued. Otherwise the complaint will be dismissed. In other words, in the issue of the complaint the federal trade commission expresses no final judgment as to the legality of the proposed merger.

"If an order to cease and desist from the proposed merger is issued, it is of course, subject to review by the United States circuit court of appeals."

Commercial Arbitration Plan Spreading

Washington, Sept. 12.—Commercial arbitration, the furtherance of which is the object of a bill now being drafted for introduction in congress, is making great strides and is supplanting costly litigation, states A. J. Wolfe, chief of the division of commercial laws of the department of commerce. The combined efforts of the department, trade groups and bar associations, says Mr. Wolfe, "are beginning to get results in the form of a plan, worldwide in its scope, providing for the enactment of a national law in this country and for treaty arrangements to make it effective abroad."

Never before in history has the feeling been so strong that arbitration is the solution of difficulties arising between merchants, according to Mr. Wolfe. Much of the support that has rallied to the proposal has been prompted by the recent epidemic of cancellations. In New York state an arbitration act is now in force. The American Bar association has endorsed the proposed federal law. The Chamber of Commerce of the United States also is attempting to help set up the machinery that will bring disagreeing elements across the table instead of before the bench.

Canada Heaviest Buyer

Washington, Sept. 12.—Canada was the foremost buyer of American iron and steel in July, taking 48,010 tons out of a total of 159,338 tons exported, according to the iron and steel division of the bureau of foreign and domestic commerce. Canada's purchases included 8630 tons of ingots, blooms, billets, sheet bars and skelp, 6427 tons of iron and steel bars and rods other than wire, 3808 tons of iron and steel plates, 5780 tons of structural material, 3526 tons of black steel sheets, 3101 tons of galvanized sheets, 2369 tons of steel rails, and 1899 tons of hoops, bands and strips. Japan, which was the second largest buyer in July, took 16,886 tons of steel rails, 8153 tons of black steel sheets, 2746 tons of scrap iron and steel, 1339 tons of tin plate, 1330 tons of rail fastenings, 1284 tons of bars and rods, and 1210 tons of structural steel.

Fatality Rate Is Lower

Washington, Sept. 12.—Fatalities at coal mines in the United States in the first seven months of 1922 totaled 917, compared with 1163 in the corresponding seven months of 1921. This was a decrease of 21 per cent. The decrease in production from the same months of last year was 19 per cent, the bureau of mines points out. The fatality rate for the seven months this year was 4.05 per million tons and for last year 4.16. Coal mine fatalities in July numbered 74, against 162 in last July.

Adopts Report for 8-Hour Day

Executive Board of American Engineering Council Takes Action on Findings of Committee on Work-Periods, Representing Two Years of Investigation—Analyzes Situation in Iron and Steel Industry

BOSTON, Sept. 12.—The 12-hour shift in the steel industry must go, according to leading engineers, manufacturers, economists and technical educators represented at the meeting of the executive board of the American Engineering council in Boston last week. The decision is in the form of a report prepared during the last two years and embodying exhaustive analyses of all industries wherein operations are continuous. Indicating the scope of the inquiry and its possible influence on the steel industries, in 1919 the United States Steel Corp., the report says, employed approximately 70,000 12-hour employes. Some 150,000 workers in the steel industry in this country are on 12-hour shifts.

Prof. Samuel McCune Lindsay of Columbia university, representing the Cabot fund of Boston, has styled the report as the "most important investigation of any industrial situation ever undertaken in this country." Essentially it is an analysis of existing operations under 8 and 12-hour shifts and offers a plan for the development of the 8-hour shift universally.

"The tendency throughout the world is toward the abolishment of the 12-hour shift," says the report of the committee on work-periods, which was adopted after a long discussion by the executive board. The report in effect finds that the two-shift day of 12 hours each is not an economic necessity in American industry. It states:

"In almost every continuous industry there are plants which are operating on an 8-hour shift basis in competition with 12-hour shift plants. In practically every major continuous industry, plants which have changed from 12 hours to eight hours have increased the quantity of production per man up to as much as 25 per cent. In a few cases the increase has been much higher."

In the iron and steel industry which is made the subject of a special report it was found that "the change from the 12 to the 8-hour day has secured results sufficient to compensate in whole or in part for the extra cost."

Other advantages of the 8-hour day in the iron and steel industry are described as increased efficiency, better morale, elimination of the "floating gang," which is maintained to give 12-hour men a day off a week, and greater prestige of the industry with the public.

The Cabot fund co-operated in the engineering investigation. Professor Lindsay, who is president of the Academy of Political Science, authorized the statement that Prof. Henry R. Seager, of Columbia university, president of the American Economic association, shared his general view as to its importance.

Engineers, economists, manufacturers and educators from all sections of the country attended the meeting of the executive board at the Hotel Bellevue. The meeting lasted two days and many vital engineering, social and economic questions were considered. Dean Mortimer E. Cooley, of the University of Michigan, successor of Herbert Hoover as the first president of the American Engineering council, presided at Friday's session when the committee report was adopted.

The results of the industrial investigation, which engineers said will exercise a great influence on the general labor situation, were obtained through two lines of inquiry. One inquiry, embracing the iron and steel industry of the country, was directed by Bradley Stoughton, of New York, former secretary of the American Institute of Mining and Metallurgical Engineers and former adjunct professor of metallurgy in Columbia university.

Discussion Is Spirited

The second inquiry was directed by Horace B. Drury, industrial investigator and former member of the faculty of Ohio State university. Each inquiry was made the subject of a separate report, the whole investigation being in charge of the council's committee on work-periods, of which Dr. H. E. Howe, of Washington, is chairman. Doctor Howe presented the report to the board. His associates on the committee are J. Parke Channing, L. P. Alford, Fred J. Miller and Dwight T. Farnham, of New York; Morris L. Cooke, of Philadelphia, and L. W. Wallace, of Washington.

Presentation of the report caused a spirited discussion for two hours, during which President Cooley in urging its adoption asserted that the report was a remarkable contribution of the engineering profession toward the advancement of mankind. Others participating in the debate were Philip N. Moore, of St. Louis; Prof. Joseph W. Roe, of New York university; Irving E. Moulthrop, of Boston, and W. W. Varney, of Cleveland; Calvert Townley, of New York; E. S. Carman, of Cleveland; John A. Stevens, of Lowell, Mass.; William Rolfe, of St. Louis, and Messrs. Channing, Alford and Wallace, representing the committee on work-periods. The report was finally adopted by an overwhelming vote.

The Drury report was described as a general survey of all industries operating continuously 24 hours a day. The leading continuous industries investigated are divided into four groups as follows:

Group I—Iron and steel, nonferrous metals, glass, portland cement, lime, brick and pottery.

Group II—Heavy chemicals, fertilizers, explosives, dyes, industrial alcohol, wood distillation, refined corn products, soap, glue, drugs, etc., electro chemical industries, sugar, table salt, petroleum, cottonseed oil and other oils.

Group III—Paper, flour, rubber, breakfast foods, automobiles, textiles and mines.

Group IV—Power, gas, water supply, ice, shipping, railroads, street railways, telegraph and telephone, mails and express, policemen, firemen and watchmen.

Few Without 12-Hour Shift

"There are few continuous industries which do not have 12-hour plants," says the report. "Of some 40 or 50 continuous industries a number are overwhelmingly on three shifts. The majority are partly on two shifts and partly on three shifts with three-shift operation in the preponderance. There are a half dozen industries in which two-shift operation is so nearly universal that it is difficult to find an exception." The report continues:

"Outside the steel industry the total number of employes on 8-hour shifts is now considerably larger than the total number of employes on 12-hour shifts. Taking into consideration all continuous industries between one-half and two-thirds of all workers on continuous operation are on shifts averaging 12 hours.

"There are upward of 40 continuous industries operating more or less completely upon a shift system. They employ between 500,000 and 1,000,000 wage earners on shift work. Their families constitute from 1,500,000 to 2,000,000 persons who are dependent upon earnings from shift work.

"There are 300,000 wage earners working on 12-hour shifts. They and their families number more than 1,000,000 persons.

"The logical alternative to the two 12-hour shift system is the three 8-hour shift system, and this is the usual procedure. Nevertheless, other shift systems have been resorted to in a lim-

ited way, in changing from the 12-hour shift.

"The effect of the 8-hour as compared with the 12-hour shift operation on the quantity and quality of production, absenteeism and industrial accidents has been satisfactory where good management and co-operatoin of labor have been secured. In practically every major continuous industry there are plants which have increased the quantity of production per man as much as 25 per cent. In a few exceptional cases the increase has been much higher. Evidence shows also an improvement in quality of production following the reduction in the length of shifts."

The Stoughton report relating to iron and steel asserts that the fact many plants operate successfully on the three-shift system indicates profits need not suffer if the change is made with wisdom. The Stoughton report continues:

"The cost of all labor, on either system at the blast furnace is less than $1 per ton of pig. Judge Gary testified before the Lockwood committee in New York in June, 1922, that the United States Steel Corp. could produce at $2 per ton less than its competitors. This shows what low overhead and technical skill can accomplish.

Operating Costs Compared

"The operating labor in the case of pig iron is from 5.8 to 8 per cent of the total manufacturing cost. Only a part of the labor in the industry is working the 12-hour day. If that labor was changed to the 8-hour day and paid as much per day as it is now getting for 12-hour work even without securing any compensating advantages through increased efficiency, morale, etc., the total manufacturing cost of the product would be increased only from 3 to 15 per cent.

"This is in most cases less than the variations in cost already experienced by competing plants, due to difference in efficiency of equipment, technical skill, purchasing, location, capital resources, overhead expense and advantages due to good management.

"As a matter of actual experience it is known that some plants have changed from the 12-hour to the 8-hour day and reduced their labor costs. Others have reduced their total manufacturing cost. Others are operating on the 8-hour day with satisfaction to management and stockholders.

"The United States has the most profitable iron and steel industry in the world, making more money and having more output than all the rest of the word put together, and exporting its product in successful competition with foreign countries.

"The majority of managers and executives with whom the matter was discussed believe that the good of the industry can be better served by eliminating the 12-hour day than by increasing dividends, provided by means of labor-saving devices and in other ways this step can be taken without serious injury to the industry."

The Stoughton report finds that the 8-hour day makes better men physically and mentally, attracts a better class of men to the industry, improves conduct of operation, makes operation more uniform, betters the quality of product, uses less fuel, involves less waste and less repairs to equipment, and lengthens the life of apparatus. These advantages, the Soughton report says, are bound up in "increased efficiency manifested in increased production per man per hour and per machine per day."

The 8-hour day, it is declared, produces better morale among workers, resulting in less absence and tardiness, less shirking and better discipline, which results from "better spirit of the men and the greater pressure which foremen can and will exert because they do not have to hold back out of sympathy for tired men."

According to the Stoughton report, which deals with the change from the 12-hour to the 8-hour shift in the iron and steel industry, there are about 150,000 wage earners in the entire steel industry on 12-hour shifts.

The report makes recommendations for successful and economic change from the two-shift operation.

American Rail Contract Opposed in Glasgow

London, England, Sept. 1.—Referring to a contract for steel rails recently awarded by the municipality of Glasgow to the United States Steel Products Co., the *Glasgow Herald* says:

"The placing of contracts for special tramway track work (steel rails) will probably lead to controversy at the meeting of Glasgow corporation. As already reported, tenders were asked for and in response several British firms and the selling agents for the American steel combine submitted offers. The tender of the American firm, the United States Steel Products Agency, amounting to £15,325, being lowest, was recommended for acceptance by the sub-committee on works. A Sheffield firm quoted £18,262 and were the lowest offerers among the British concerns.

"When the question came before the tramways committee it was agreed to refer the recommendation back for inquiry with regard to the conditions of labor in America. The labor members, who voted against the American offer, contend that the conditions in the United States are inferior to the conditions in this country. It is urged that American steel workers are obliged to work 12 hours daily, and are not allowed trade union rights, whereas in Britain the men have an 8-hour day and recognition of their unions. Labor members assert that in view of these circumstances the 'fair wage clause' in corporation contracts is not observed by American producers, and therefore that American tenders are ruled out."

The Glasgow Council decided by a majority of two votes to accept the offer of the United States Steel Products Co. to supply the tramway rails. On behalf of the city the council was urged not to "throw away £3000 on Sheffield."

During the council's discussion the town clerk read a letter from the United States company dated Aug. 18 stating that at the works at which the material would be manufactured no one is engaged more than 10 hours a day, and in many departments, such as the foundry, the average is eight hours. There are, of course, men employed in light occupations, such as watchmen and powerhouse men, who are on duty 12 hours, but the actual working time in some cases is less than six hours, according to the letter. Figures were quoted showing that the average earnings of the employes in the steelworks represented by the company in 1921 were $5.61 per day. "We are prepared," the letter went on, "to guarantee that the rates of wages and hours and conditions of employment are in all cases equal to, or if anything more favorable, than those ruling in any mill in America. As an indication of the wages earned we would mention that it is becoming quite a problem to provide space to park motor cars owned by employes at the works."

Announce Details of New Coal Combination

Details of a consolidation of bituminous coal interests in the Pittsburgh and western Pennsylvania districts, involving perhaps 20 of the principal operators, with normal annual production of 8,000,000 tons and assets of $35,000,000, were made public by J. H. Sanford, vice president of the Carnegie Coal Co., late last week. The merger is in process of formation, and the Union Trust Co., of Pittsburgh is acting as fiscal agents and trustees.

In the new organization are included the following operating companies, with the production of each for 1920 being given: The John A. Bell interests, 2,000,000 tons; Carnegie Coal Co., 1,350,000 tons. Verner Coal & Coke Co., 345,000 tons. Burgettstown Coal Co., 255,000 tons. Henderson Coal Co., 325,000 tons. Chartiers Creek Coal Co., 270,000 tons. McClane Mining Co., 475,000 tons. Meadowlands Coal Co., 500,000 tons. Pittsburgh & Eastern Coal Co., 240,000 tons. Pittsburgh & Erie Coal Co., 430,000 tons. Western Pennsylvania mines of the Youghiogheny & Ohio Coal Co., 1,120,000 tons.

A number of other operators with mines producing along the lines of the Wabash railroad are identified with the new project and will add another 1,500,000 tons to these figures. Practically all of the companies named are, or were until recently, members of the Pittsburgh Coal Producers' association.

The Electric Power club has moved its headquarters from 1017 Olive street, St. Louis, to 1005 Kirby building, Cleveland.

Strikes Cut July Steel Exports

Tonnage Drops Again but Domestic Demand Increases Imports of Mill and Furnace Products—Incoming Volume Greatest in 20 Months—Manganese Ore and Iron Ore Receipts Also Larger

DECREASED exports, after recent increased and larger imports of iron and steel in July clearly are the reflection of the fuel and transportation situations in the United States. Exports of mill and furnace products dropped to the lowest point since February and rank the third lowest of the year. Imports made their fourth successive monthly gain and stand at the highest point since November, 1920.

July iron and steel exports dropped to 157,027 tons, from 216,298 tons in June. This is a decline of 59,271 tons and only 23,694 tons above the 133,333 tons exported in February. Inability of iron and steelworks to produce freely because of the lack of fuel and to make shipments may be assigned largely as the reason for the comparatively small tonnage exported. The same causes account for the importation of 44,285 tons of foreign iron and steel, a gain of 20,184 tons, or approximately 84 per cent over June's 24,101 tons. The month's imports, compared with 50,995 tons in November, 1920, and 3672 tons in February, 1921, the lowest point in years.

Accounting for part of the import tonnage is 18,828 tons of pig iron which compares with 5850 in June, a gain of nearly 13,000 tons. In addition 12,306 tons of ferromanganese, the greater part of which was bought in Great Britain, was received. Bar iron imports jumped from 268 tons in June to 10,131 tons in July. The increase in the pig iron and bar iron tonnages accounted for the month's entire gain since there were slight losses in scrap, rails and other products.

Iron ore imports also gained heavily in July, imports totaling 166,711 tons as against 133,817 tons in June. Shipments gained through 4891 tons more from Spain in July than in June, over 5000 tons more from Sweden, 11,000 tons from Cuba and 12,000 tons from other countries than Canada from which the June and July imports were about equal.

Manganese ore imports in July totaled 62,518 tons, or more than 18,000 tons above the June figure.

The greatest individual losses making up the month's net decline in exports were in scrap, 5000 tons; semifinished steel, 3000 tons; iron and steel bars, 9000 tons; black steel sheets, 11,000 tons; tin plate, 4000 tons; rails, 13,000 tons; casing and oil line pipe, 3000 tons; welded black pipe, 3000 tons; and galvanized wire, 3000 tons: Losses were reported in other products but they were less than 3000 tons in each instance.

IMPORTS AND EXPORTS

Gross tons

	1922 Imports	1922 Exports	1921 Imports	1921 Exports
Jan.	10,511	155,822	15,784	516,447
Feb.	10,216	133,333	3,650	387,900
March	8,612	206,474	14,492	210,451
April	15,884	197,562	4,847	160,921
May	17,292	229,616	10,915	140,987
June	24,101	216,298	8,258	117,864
July	44,285	157,027	10,060	84,615
Aug.	.....	.....	8,069	75,641
Sept.	.....	.....	11,743	94,650
Oct.	.....	.....	10,609	106,466
Nov.	.....	.....	9,296	125,492
Dec.	.....	.....	9,400	134,348
Total	130,901	1,296,132	117,123	2,154,756

Year	Imports	Exports
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,773	1,549,554
1913	317,260	2,745,635

FERROALLOY EXPORTS

Gross Tons

	June 1922	June 1921	Twelve months ending June 1922	Twelve months ending June 1921
Ferrosilicon	58	52	463	577
Ferromanganese	55	..	1,021	3,335
Spiegeleisen	..	..	....	....
Ferrovanadium	1	..	28	201
Total	113	52	1,512	4,113

IRON AND STEEL EXPORTS

Gross Tons

	July 1922	July 1921	Seven months ending July 1922	Seven months ending July 1921
Pig iron	1,943	2,744	15,773	15,493
Scrap	3,939	1,524	49,298	24,198
Semifinished steel*	10,140	363	67,069	4,326
Iron and steel bars†	16,415	5,543	153,565	163,989
Alloy steel bars	146		3,781	
Wire rods	1,845	843	34,135	10,963
Boiler plate	827	6,205	10,864	283,909
Other plates	6,104		54,594	
Galv. sheets	9,245	2,608	73,313	40,587
Black sheets, steel	12,829	6,819	182,371	70,600
Black sheets, iron	924	(a)	7,562	(a)
Cold rolled strips	549	1,264	2,820	13,393
Hoops, bands and scroll	2,688		17,306	
Tin and terne plate	4,039	2,924	49,453	77,302
Fabricated plates‡	34	294	1,261	7,912
Struct'l steel, plain	5,549		32,276	
Struct'l steel, fabricated	1,927	11,320	12,198	244,810
Other struct'l forms	1,262		10,985	
Rails, over 50 pounds	28,598	20,074	166,252	256,938
Rails, under 50 pounds	1,321		18,111	
R. R. spikes	601	415	4,460	6,558
Track fastenings and material	2,899	(a)	17,538	(a)
Boiler tubes	1,205		6,553	
Casing and oil line pipe	3,028		29,374	
Welded black pipe	3,937	14,484	46,682	288,683
Welded galv. pipe	2,881		18,394	
Malleable iron pipe fittings	713		4,775	
Cast iron pipe	2,446	2,630	10,366	35,814
Cast iron pipe fittings	503		4,561	
Plain wire	3,868	521	21,829	55,689
Galv. wire	5,660		56,565	
Barbed wire	10,038	1,431	40,619	20,372
Manufactures of wire	3,555	(a)	15,563	(a)
Cut nails	413	42	2,580	588
Wire nails	2,882	993	41,964	17,295
Other nails incl'd'g tacks	349	445	2,942	3,243
Bolts, nuts, rivets and washers	1,725	1,129	10,436	19,449
Total	157,027	84,615	1,298,188	1,662,111

*Include ingots, blooms, billets, slabs, sheet and tin plate, bars and skelp.

†Includes rods other than wire, and light structural forms.

‡Ship and tank plates punched and shaped.

(a) Formerly by value.

IRON AND STEEL IMPORTS

Gross Tons

	July 1922	July 1921	Seven months ending July 1922	Seven months ending July 1921
Pig iron	18,828	2,567	45,227	15,595
Scrap	9,793	1,650	38,960	21,381
Bar iron	10,131	274	11,531	1,006
Ingots, blooms and billets	882	2,829	11,033	5,080
Structural shapes	137	46	1,243	405
Rails	4,077	2,597	20,435	11,898
Sheets and plates	156	20	329	1,832
Tin and terne plates	37	....	2,119	308
Wire rods	244	77	974	506
Total	44,285	10,060	131,851	58,011

IRON ORE IMPORTS

Gross Tons

From:—	July 1922	July 1921	Seven months ending July 1922	Seven months ending July 1921
Spain	4,891	....	20,869	.....
Sweden	54,878	6,700	124,648	129,575
Canada	367	328	1,321	1,313
Cuba	56,275	....	133,572	97,125
Other countries	50,300	12	93,997	38,173
Total	166,711	7,040	374,407	266,186

IMPORTS VARIOUS ORES AND FERROALLOYS

Gross Tons

	July 1922	July 1921	Seven months ending July 1922	Seven months ending July 1921
Ferromanganese	25,841	275	53,134	5,481
Ferrosilicon	2,300	309	7,076	1,932
Manganese ore	62,518	5,028	210,747	297,403
Tungsten-bearing ore	704	47	1,072	856
Nickel ore	...	139	....	1,497
Total	91,363	5,798	272,229	308,169

CASTING AND FORGING EXPORTS

Gross Tons

	June 1922	Six months of 1922
Malleable iron castings	82	701
Other iron castings	646	4,547
Car wheels and axles	2,437	9,090
Shells and projectiles, empty	...	169
Steel castings	96	1,085
Iron and steel forgings	387	1,263
Total	3,648	16,855

Indict 58 for Herrin Massacre

Grand Jury Composed of Farmers To Reconvene Sept. 18 To Resume Investigation—Law-and-Order Forces Determined on Justice—Hints of Corruption in Dealings Between Operators and Union Heads Are Heard

CHICAGO, Sept. 12.—Seventy six days after the massacre of 19 nonunion miners in Williamson county, Illinois, a grand jury composed of farmers, not connected in any way with mine operators or trade unions has returned indictments against 58 men, 11 of whom are in jail.

A blanket indictment has been returned, in addition to the individual true bills, naming the 58 men and alleging conspiracy to murder. All of the 19 victims of the massacre are named or described in the blanket indictment. Another indictment charges the entire 58 with rioting, the penalty for which is a term in the penitentiary. Twelve new bills have been returned, regrouping the 27 men charged with the murder of John Shoemaker, to allow separate action against the men charged with being leaders of the mob or especially active members of it.

The grand jury has recessed until Sept. 18, when the inquiry will be resumed. At that time the death of three union miners in an attack on the mine the day preceding the massacre will be inquired into.

In answer to many rumors of the grand jury being swayed by political and other influences John Stewart, foreman, mate a statement of their attitude in the presence of the 22 farmers composing the jury. He said:

"We wish to correct sentiment prevalent throughout the country that our investigation will not be thorough and that it will be swayed by political and other influences. We will make an absolutely thorough investigation and if any influence is attempted we will not listen to it and will positively disregard it. We will be thorough in our work, regardless of the results and there will be no phase or angle that we will not examine into. We will investigate into the deaths of union coal miners in the same thorough manner we are now investigating into the death of nonunion men. We will also investigate the actions of the Southern Illinois Coal Co. and William J. Lester, its president, and should we find them responsible in any manner will not hesitate to indict them any more than we shall hesitate to indict any other guilty party."

Attorney General E. J. Brundage has refused the request of labor union attorneys to agree to bail for the indicted men as the price of their immediate surrender. He holds that bonds can be granted in the murder indictments only by the court and that it will be necessary for the defendants to make some showing that the presumption of guilt is not great. No fears are being held that any of the indicted men will escape, though it has been reported that some have fled. Flight seems like a confession of guilt, he believes, and "such surveillance is being exercised as will prevent any indicted men getting away."

As the case stands at the moment the delay in starting the inquiry has not weakened the prosecution, but rather has given it strength. In the interval investigators for the government and the state have accumulated a mass of evidence which has been card indexed and made available for the prosecution. Sentiment among the more substantial citizens of Williamson county has undergone a change and the constant pointing of the finger of scorn by the outside world has caused a reaction that tends toward justice.

State politics and a political quarrel between Governor Small and Attorney General Brundage hampered action for a time, the latter claiming veto of appropriations prevented the state from acting. The Illinois Manufacturers association, the Illinois Chamber of Commerce, the Chicago Association of Credit Men and other organizations of business men have raised a fund to support the state law machinery and the government has loaned the services of C. W. Middlekauff, of Chicago, special assistant to the United States attorney general, who is acting with Mr. Brundage in the conduct of the case. The Williamson county prosecutor also is active.

An angle of the case of much interest to those who have followed the history of coal mining, wage scales and the internal politics of the miner's unions is the fight between Frank Farrington, president of the Illinois body of miners, and John L. Lewis, president of the national union. Hints of this having been a factor in the disorder have been heard and the telegram of President Lewis as to the status of the steamshovel men is regarded as one of the prime factors in inciting the riot.

Another angle is the apparent community of interest between union officials and mine operators, which has been plain to all observers for many years. Wealth accumulated by union officials during their terms of office has indicated sources of income other than from salaries. Trial of indicted men, whether miners or others, as the outcome may be, is likely to rattle some of the bones in the union labor closet as the massacre is regarded simply as a surface indication of corruption in the organization.

Net results of the grand jury's inquiry so far are regarded as satisfactory and hope is held that its further action on reassembling will clear the slate and pave the way for the court to wipe out the stain on the state resulting from the riot and massacre.

Electric Heaters

In Demand in Canada Due to Coal Shortage —Rail Mill Down

Toronto, Ont., Sept. 11.—The prospect of a serious coal shortage during the winter has greatly stimulated the electrical supply industry. There is an unprecedented demand for electric heaters and electric household appliances and dealers are overwhelmed with orders. The extension of the provincial hydro-electric system into many of the rural districts is popularizing the use of electrical appliances by farmers, the principal demand is for heaters and dealers are weeks behind in their deliveries.

The Algoma Steel Corp., of Sault Ste. Marie, has been compelled to close its rail mill vice president W. C. Frantz states that even if coal shipments began to come through at once it would be two months before enough coal could be unloaded to keep the mill in operation. He expects the rail mill to be closed until January. There is sufficient coal on hand to keep two blast furnaces and the coke ovens going at present. The corporation will continue to manufacture pig iron as long as the coal lasts. The operation of this department will give employment to about one-quarter of the steel plant forces. Even could coal be obtained now its price would be so high that it would be impossible for the mill to compete in the rail market the management states.

The British Empire Steel Corp., has granted the employes of the Sydney steel plant wage increases from 10 to 15 per cent. Approximately 2800 men are affected. The minimum rate paid for common labor is increased from 24½ and 26 cents to 28 annd 30 per hour.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

GEORGE F. DOWNS, president of the Lackawanna Steel Co., is to resign upon the formal transfer of that company to the Bethlehem Steel Corp., it has been announced. Mr. Downs, it is understood, declined a position under the Bethlehem-Lackawanna merger and is to go to California upon his retirement. Mr. Downs for 15 years served in the operating department of the Lackawanna Steel Co., and was elected president of that company July 14, 1920. He went with the Lackawanna company in 1905 as as assistant superintendent of the Buffalo plant. In 1909 he was made general superintendent, and on Jan. 1, 1919, was made vice president in charge of operations. Prior to this connection with the Lackawanna Steel Co., Mr. Downs spent 10 years at the South Works of the Illinois Steel Co., South Chicago, under E. A. S. Clarke, then superintendent of the South Works, and who later became president of the Lackawanna Steel Co. and now is president of the Consolidated Steel Corp. Mr. Downs is a director of the Consolidated corporation, which is the export combination of which the Lackawanna Steel Co. is a member. He is also a director of the American Iron and Steel institute.

William H. Woodin, president of the American Car & Foundry Co. has been appointed fuel administrator of New York state.

Congressman Schuyler Merritt, who is vice president of the Yale & Towne Mfg. Co., Stamford, Conn., has returned from a European trip.

Charles L. Taylor, secretary and treasurer of the Taylor & Fenn Co., Hartford, Conn., has returned from Europe.

George Roberts of the Thistle Wire Works, Lee, Mass., returned recently from his annual visit to his old home in Scotland.

B. D. Quarrie, vice president and general manager of the Otis Steel Co., Cleveland, has been elected director of the Guardian Savings & Trust Co., that city.

A. D. Neal, recently connected with the roll department of the Duquesne Steel Foundry Co., Pittsburgh, and formerly indentified with the sales department of the Carnegie Steel Co., Homestead, Pa., has been added to the sales force of the Pittsburgh Rolls Corp., Pittsburgh.

Frank B. Worrilow, for the past five years superintendent of the Millbury Steel Foundry Co., Millbury, Mass., has resigned to become assistant superintendent of a foundry in Pittsburgh.

Sidney W. Farnsworth has resigned as assistant general manager of the Harvey Electrical Co., Chicago, to become chief mechanical engineer in the post-office department, Washington. Mr. Farnsworth, who is graduate of the Worcester Polytechnic institute, Worcester, Mass., class of 1906, formerly was assistant to the vice president in charge of operations of the Steel & Tube Co. of America, Chicago.

John J. Curry, of 11 Sargeant street, Hartford, Conn., has been appointed mechanical superintendent of Plant D., of the New Departure Mfg. Co. Plant D. is the newest plant of the ball bearing manufacturing subsidiary of General Motors, Inc., and is at Meriden, Conn. Mr. Curry is a graduate of Pratt institute. He has been employed in the tool division of the New Departure plant at New Britain, Conn., for a number of years.

Herbert S. Keyser, who for the last seven years has been secretary and general manager of the Wolverine Supply & Mfg. Co., Northside, Pittsburgh, and prior to that for 13 years accountant with the American Bridge Co., has been elected executive secretary of the Pittsburgh Association of Credit Men. He has been a member of the board of the association for several yars and is president of the Pittsburgh chapter of the National Association of Cost Accountants.

Calvin W. Rice, secretary of the American Society of Mechanical Engineers, has been elected an honorary member of the Koninklijk Institut van Ingenieurs, the Holland engineering society. Mr. Rice is in Rio de Janeiro representing American engineering societies at the International Engineering congress. In his absence Fred J. Miller, past president, is acting secretary. Jesse Merrick Smith has been elected delegate of the American society to the seventy-fifth anniversary celebration of the Dutch society.

Drop Forgers To Meet with Steel Treaters

The annual convention of the American Drop Forging institute, will be held in Detroit Oct. 3 to 6, concurrently with the convention of the American Society for Steel Treating.

The institute was formed in 1920, because there was at that time no organization adequately representative of all of the varied and important interests of the industry with the principal object of improvement of production and technical methods.

Information is collected and distributed at regular intervals covering: The total volume of purchases of the important classes of material, with current market prices; rates of wages and earnings, hours of labor, and number of men employed, by classes; total hammer-hours operated, as compared with the capacity of the membership, in each of several classes of equipment; total tonnage of steel consumed, and the total volume of shipments made; total volume of new business booked and of unfilled business on the books of members.

Besides the manufacturing division, in charge of the group meetings and of the annual convention, a purchasing agents' division has been established and the organization of an accounting division, is now contemplated.

The present officers of the institute are: President, J. H. Williams, J. H. Williams & Co., Brooklyn, N. Y.; vice president, H. G. Stoddard, Wyman-Gordon, Co., Worcester, Mass.; O. F. Transue, Transue & Williams Steel Forging Corp., Alliance, O.; directors, C. E. Adams, Cleveland Hardware Co., Cleveland; F. C. Billings, Billings & Spencer Co., Hartford, Conn.; C. A. Brauchler, Canton Drop Forging & Mfg. Co., Canton, O.; Ferdinand Barnickol, Indianapolis Drop Forging Co., Indianapolis; A. H. Chapin, Moore Drop Forging Co., Springfield, Mass.; J. F. Connelly, Champion Machine & Forging Co., Cleveland.

Obituaries

JOHN H. Flagler, founder and first president of the National Tube Co., died at his country home in Greenwich, Conn., Sept. 8 of pneumonia, following an illness of five days. Mr. Flagler was born at Cold Springs, N. Y., 85 years ago and received his education at the academy at Paterson, N. J. Refusing to go to college, he entered the employ of his uncles, John and James Haldane, iron dealers in New York, under the name of Haldane & Co. For several years he was manager of the Boston branch of this company and then left the Haldanes to organize John H. Flagler & Co., which established a plant in East Boston to manufacture iron and steel and particularly tubing. Owing to the increased demand for tubing in the oil fields of Pennsylvania, Mr. Flagler soon established a branch at McKeesport and this later became the headquarters of the company, the Boston house ceasing to exist. The company was reorganized as the National Tube Co. and when its plant was merged into the United States Steel Corp., 4500 men were on its payroll. Mr. Flagler not only was an executive but he invented certain processes of value in the manufacture of tubing. At the time of his death, Mr. Flagler had retired from all active promotion of business enterprises, and the only connections he retained were his memberships in many of the directorates of life insurance and banking companies and societies and associations.

John A. Bickerstaff, formerly identified with the steel industry in Pittsburgh, but who retired several years ago, died Sept. 3 at Jacksonville, Fla. He was born near Aliquippa, Pa., 65 years ago and had lived most of his life in Pittsburgh.

John M. Potter for 32 years connected with the Northwestern Malleable Iron Co., Milwaukee, as treasurer, died Sept. 6 after a brief illness, at the age of 61 years. He was born in Elmira, N. Y. and went to Milwaukee as a young man.

Terrence F. McEvoy, aged 76 years who for more than half a century was active in the Soho iron and steel district of Pittsburgh, died Sept. 4 at his home in that city. He was born in Mt. Mellick, Queens county, Ireland, Dec. 6, 1846. His parents came to America when he was aged four and settled in Pittsburgh. As a boy he went to work in the Moorehead-McClain mills in Soho. At the time he retired in 1894 he was the general manager of the plant. After his retirement he devoted his time to travel, visiting many parts of the world.

Albert A. Peirce, aged 29 years, assistant superintendent of the Dravo Contracting Co., Pittsburgh, was drowned in Detroit, Sept. 4, by falling from a hoisting bucket to the bottom of a salt shaft. He had been identified with the company for four years.

Thomas B. Bryson, vice president and general manager of Holbrook, Cabot & Rollins, construction engineers, 50 Vanderbilt avenue, New York, died at his home in that city, Sept. 6, aged 50 years. Mr. Bryson was born in Mechanicsburg, Pa., and was a graduate of Cornell university. He was to have had control of the construction of the Manhattan entrance and exits of the New York-New Jersey vehicular tunnel. He was a member of several clubs and organizations, including the Engineers Club of New York.

James W. Kinnear, aged 63 years, Pittsburgh attorney, died in Mayo Bros. hospital, at Rochester, Minn., Sept. 8, where he had gone for an operation. Mr. Kinnear was president and director of the American Stainless Steel Co.; vice president and director of the Firth-Sterling Steel Co.; director of the Pittsburgh Cold-Rolled Steel Co.; vice president and director of the Washington Steel & Ordnance Co.; and president and director of the Wolf-Tongue Mining Co. Mr. Kinnear was prominent in church and Sunday school work and was a member of the council of the American Y. M. C. A. to make a survey of its war work in Europe. He had spent the greater part of 1918 on the battlefields of Europe. Mr. Kinnear also was a director of the Keystone National bank and of the Pennsylvania Association for the Blind. He was a trustee of Allegheny college.

Mr. Kinnear was a member of the law firm of Kinnear, McCloskey & Best in the Oliver building. He was born in Tidioute, Warren county, Pa. Mr. Kinnear received his preparatory education in the public and other schools of his native county. Later he entered Allegheny college at Meadville and was graduated from that institution.

Steel Ingot

Production Shows a Drop of Approximately 272,000 Tons in August

Output of steel ingots in August totaled 2,214,582 gross tons according to statistics compiled by the American Iron and Steel institute from production figures reported by 30 companies, which in 1921 made 87.5 per cent of the total for the country. Production during the month was slightly less than the output in March of 2,370,751 tons. Compared with the output of July of 2,487,104 tons, the August output showed a loss of 272,522 tons. With the 147,373 loss of July over June, ingot production has made a decline of 419,895 tons in two months. Production now stands 496,559 tons below the high point for this year which was 2,711,141 tons in May.

Following are the institute's production figures for all of 1921 and the first eight months of 1922:

1921	Open hearth	Bessemer	All other	Total
Jan....	1,591,281	608,276	3,429	2,203,186
Feb....	1,295,863	450,818	2,796	1,749,477
March..	1,175,591	392,983	2,404	1,570,978
April...	1,000,053	211,755	2,150	1,213,958
May....	1,047,810	216,497	1,543	1,265,850
June....	808,286	193,644	1,476	1,003,406
July....	689,489	113,312	575	803,376
Total for 8 mo.	8,523,707	2,408,401	16,194	10,948,302
Aug....	915,334	221,116	1,621	1,138,071
Sept...	908,381	265,152	1,207	1,174,740
Oct....	1,269,945	345,837	1,028	1,616,810
Nov...	1,294,371	363,912	1,718	1,660,001
Dec...	1,129,174	296,380	1,539	1,427,093
Total for year.	13,125,578	3,679,682	21,686	16,526,946
1922				
Jan....	1,260,809	331,851	822	1,593,482
Feb...	1,395,835	348,571	616	1,745,022
March..	1,918,570	451,386	795	2,370,751
April...	1,997,465	445,939	1,109	2,444,513
May...	2,214,774	494,893	1,474	2,711,141
June...	2,143,708	487,851	2,918	2,634,477
July ..	2,020,572	464,047	2,485	2,487,104
Aug. ..	1,807,310	404,379	2,893	2,214,582
Total for 8 mo.	14,759,043	3,428,917	13,112	18,201,072

Average daily production of the 30 companies during August was 82,021 tons which compared with the 95,658 tons of July, was a loss of 13,637 tons. Upon this basis the average daily rate of the whole country was 93,738 tons or 15,585 tons less than the 109,323-ton rate of July.

Calculated upon the average daily output of August and 311 working days per year the approximate annual rate of production during August for the 30 companies was 25,500,000 tons, or 4,250,000 tons less than the 29,750,000-ton indicated rate of July. The approximate rate of production for the whole country was 29,150,000 tons and 4,850,000 tons less than the corresponding figure of 34,000,000 tons for the preceding month. The annual indicated rate of output in August was about 52 per cent better than the total ingot production in 1921 and was about 65 per cent of the record output of 1917.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

CAPACITY of the Hartford Foundry & Machine Co., Hartford City, Ind., has been more than doubled by the completion of a 60 x 90-foot addition to its foundry. A traveling crane, a number of molding machines and other modern foundry equipment have been installted. The company now is in position to handle castings up to five tons and production class of material, including automobile cases.

* * *

WIRE, wire fencing and wire products are to be manufactured by the Canada Fence Co., Ltd., Toronto, Ont., which recently was incorporated with $1,000,000 capitalization authorized. The incorporators were Helen W. Currie, Vida I. Harris and others.

* * *

THE Illinois Car & Mfg. Co., Hammand, Ind., has bought the plant and business of the American Nut Co., Columbus, O., and will remove it to Hammond where production will be started as soon as the machinery can be set up. Raw material is being contracted now for first quarter use.

* * *

PLANS are being made by the National Enameling & Stamping Co., Granite City, Ill., for the erection of an addition to its open-hearth plant to contain five 80-ton furnaces. This company is also about to start erection of a sheet mill addition to contain six mills and a galvanizing plant.

* * *

THE Shafer Bearing Corp. has bought the plant of the All American Truck Co., Grand avenue and Sixty-fifth avenue, Chicago, including a tract of 8½ acres and 68,000 square feet of floor space. The purchaser will remove its plant to the new location where more space is available for production of bearings.

* * *

OFFICES have been opened at 39 Cortlandt street, New York, by the Oilgear Co., Milwaukee, in order to be in closer touch with the eastern territory. Russell, Holbrook & Henderson, 30 Church street, New York have been appointed sales representatives of this company for the district in and near New York City. The Cadillac Machinery Co., Lafayette and Beaubien streets, Detroit, will handle the Oilgear Co.'s products in Michigan and the R. E. Ellis Engineering Co., 621 Washington boulevard, Chicago, will represent the company in Chicago and the surrounding district.

* * *

IMPROVEMENTS being made in the plant of the Quidnick-Windham Mfg. Co., Williamantic, Conn., are now in progress but the company will not require any additional equipment or supplies other than those already purchased, according to W. B. Knight, agent.

* * *

A DEPARTMENT for remanufacturing foundry molding machines has been opened by the Champion Foundry & Machine Co., 3018 West Twenty-first place, Chicago. The machines are disassembled, cleaned and renewed, putting them in practically new condition. The service includes an engineering department, advice as to proper machines and mounting patterns.

* * *

CONSTRUCTION and repair of boats and barges, building of bridges and tanks and the fabrication of other forms of structural steel is the purpose of the Mid-West Boat & Barge Co., Inc., which hes been organized at Grafton, Ill., with $50,000 authorized capital. Its plant already is complete and in operation. Its principal offices are at Water Front and Oak streets, Grafton. Officers of the company are: President, Albert A Coyle; vice president John F. Erdelen; sectary-treasurer, Samuel Edwards; and manager, Maurice Killeen.

* * *

PROPERTY and patents of the Keyless Lock Co., Akron, O., have been purchased by the Barberton Machine & Foundry Co. which recently was incorporated with $10,000 capital. The company is on a partnership basis, with James Singer as engineer in charge. The company is erecting a building, 30 x 50 feet, of brick and frame construction, to be used for experimental purposes. Later a larger building is to be erected for the production of castings. In a short time the company will be in the market for foundry supplies.

* * *

CONSTRUCTION is nearing completion of a steamer and three steel covered barges for the Prado mines of Bogota, Colombia, by the John Eich'eay Jr. Co., Pittsburgh. The steamer is 126 feet long and will transport general merchandise on the Canca and Magdalene rivers to the interior of Colombia. The boats will be finished in about three months and will be shipped to South America knocked down. The Eichleay company also is building a small boat for the Mississippi river commission. It is to be equipped with a diesel engine and will be named the BELTAIN.

* * *

CONSOLIDATION of the Prima Radio Corp. and the Manufacturing Tool & Die Works, both of New York, as the Prime Radio Corp., is proceeding and the new company will have a capitalization of $50,000 in 8 per cent preferred stock, par value $10, and 1,500,000 shares of common, $1 par value. William D. Puckrin will be chairman of the new company and William Shilling president.

* * *

NEW quarters at 59-89 West Commercial street, Portland, Me., now are being occupied by E. Corey & Co., iron and steel merchants who have been in business since 1806. The plant has a frontage of 632 feet and a depth of 200 feet and private tracks. The company has added sheets, roofing and industrial mill supplies to its business. Samuel S. Boyd is president and James C. Boyd treasurer.

* * *

SALE of the Precision & Thread Grinder Mfg. Co., 1 South Twenty-first street, Philadelphia, has been made to A. T. Doud. Mr. Doud, who formerly was mechanical engineer for the Hale & Kilburn Co., Philadelphia; general superintendent of the Speakman Co., Wilmington, Del.; works manager of the Diehl Mfg. Co., Elizabeth, N. J.; general manager of the Hero Mfg. Co., Philadelphia; and manager of manufacturing for the American Tube & Stamping Co., Bridgeport, Conn., has been elected president of the Precision & Thread Brinder company. Associated with him is F. V. Doud as secretary and C. A. White as a director. Mr. White is secretary of the Leads & Northrup Co., Philadelphia, and was associated with Mr. Doud in the Hero and American companies. F. Rodger Imhoff is consulting engineer with the company.

Oven Output

In Coke By-Product Industry Increased—Business Is Better

New York, Sept. 12.—Production of light oil distillates is improving steadily, now being around 40 per cent of normal as against 33 per cent at the time the industry was most affected by the coal and rail strikes. Operations based on a total oven capacity of the country are lower, possibly around 20 to 25 per cent, but a number of the ovens have been out of commission for months, even before the coal strike went into effect, and none of these likely will be put on this year and some not then.

One producer in the Ohio district, about two weeks ago had but one unit in active production, now has three, or about 50 per cent of capacity, and is expected by the end of this week to have four. On this basis it is assumed that operations in that district by the end of the month will at least be 50 per cent of normal.

Coke Oven By-Products

Spot	
Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.30 to $0.33
Toluol	.30 to .33
Solvent naphtha	.27 to .29
Commercial xylol	.29 to .32
Per Pound at Producers' Plants	
Phenol	$0.15
Naphthalene, flake	.07 to .08
Naphthalene, balls	.08 to .09
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.80 to $2.85
Contract	
Pure benzol	$0.30 to $0.33
Toluol	.30 to .33
Solvent naphtha	.27 to .29
Commercial xylol	.29 to .32
Per Pound at Producers' Plants	
Phenol	nominal
Naphthalene, flake	$0.07 to $0.08
Naphthalene, balls	.08 to .09
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia (12 months)	$2.80 to $2.85

In the Alabama district, there is an improvement also, due to better transportation. That district at no time was affected by a lack of coal production, as the leading producers of coal tar by-products had their own mines which they were able to keep in operation. However coal could not be moved from the mines.

Leading sellers of light oil distillates say they will not feel the effects of the present improvement in output for at least another month, as far as new business is concerned. At the moment they are, considering no business for spot shipment, and are making no definite promises as to futures. Producers carried over into September, unfilled business of about 70 per cent.

While second hands have booked some spot business at high premiums, the amount of material involved has been small and such transactions have little market weight. The market continues to be quoted nominally as follows: Pure benzol, 30 to 33 cents, f.o.b. works in tanks; and 25 to 28 cents in drums; 90 per cent benzol, 27 to 29 cents in tanks, and 32 to 34 cents in drums; solvent naphtha, 27 to 29 cents in tanks, and 33 to 34 cents in drums; toluol, 30 cents in tanks, and 35 to 38 cents in drums; and commercial xylol, 29 to 33 cents in tanks, and 34 to 27 cents in drums.

Producers of sulphate of ammonia still remain out of the market, on new business. The market is nominally unchanged at $2.80 to $2.85, f.o.b. works, on domestic business, and $3.30 to $3.35 on foreign. Naphthalene is featureless. Synthetic phenol is quoted at 12 cents, government warehouse, and fresh phenol, at 15 cents, f.o.b. works.

To Form Division

Washington, Sept. 12.—Organization of a southern division of the American Mining Congress will be undertaken at Chattanooga, Tenn., Sept. 29. Active support of proposals for completion of the Muscle Shoals, Ala., power project is being given by the congress. The secretary of the mining congress states:

"The widely diversified and disseminated deposits of graphite, phosphate, manganese barytes, pyrites and other minerals in the southern states and their successful marketing call for collective thought and co-operative action. Cheap power is a prerequisite to successful mining operations. Without highly developed transportation, successful marketing cannot be attained. The mining industry is an essential factor to national prosperity."

Boron Imparts Hardness

Washington, Sept. 12.—The use of boron as an alloy confers marked hardness on steel, the United States bureau of mines states experimental work indicates. If the other properties of the boron steels are good enough to be applicable to commercial use, the bureau adds, their remarkable plasticity at temperatures below the melting points of ordinary steels might make it possible to utilize this characteristic.

Tool Catalogs in Demand

Washington, Sept. 12.—An active demand for machinery catalogs is reported by the American commercial attache at Santiago, Chile. Many orders for machinery have been placed in Europe because of a lack of knowledge concerning American products the attache reports. Interest is centered at this time on woodworking machinery, especially that equipped with electric motor drive. The attache states that in quoting prices on machines with attached electric drive the ability to furnish both direct and alternating current motors, particularly 200 volts, should be indicated and the difference in price noted. The trend is toward alternating current equipment. Catalogs should be sent to the American commercial attache, Casila 27-D, Santiago, Chile.

To Test Alabama Ore

Washington, Sept. 12.—Tests to determine the crushing strength of samples of iron ore from the Birmingham, Ala., district are to be made at the Carnegie Institute of Technology, Pittsburgh, United States bureau of mines states. The samples to be tested are in the form of cubes cut from masses of ore. The magnometric survey of the Birmingham district is being continued by the bureau in co-operation with the coast and geodetic survey.

Refractory Output Gains

Washington, Sept. 12.—The United States geological survey estimates the value of refractory clay products of the United States in 1920 a $62,408,730, compared with $46,644,006 in 1919 and $59,793,016 in 1918. The item of fire brick, including refractory block or tile, boiler and locomotive tile and tank blocks, and similar refractory products, accounted for $53,415,888 in 1920, $38,015,792 in 1919, and $51,647,639 in 1918.

Slight Decrease in Steel Trade Employment

Washington, Sept. 12.—Employment in iron and steel works was slightly smaller on Aug. 31 than on July 31, the first time in months that the industry has been listed by the federal employment service in its monthly survey among the backsliding industries. Out of the 14 industries surveyed, only five reported increases on Aug. 31, this being due, the service explains, to labor turnover. Of the 65 cities covered, 39 reported increases on Aug. 31 over July 31, and 26 decreases. Among the cities evidencing a decrease on Aug. 31 were Pittsburgh, Youngstown, O., Toledo, O., New York, Detroit, Johnstown, Pa., Kansas City, Mo., St. Louis and Bridgeport, Conn. Among the cities reflecting an increase were Buffalo, Cleveland, Cincinnati, Philadelphia, Chicago, Reading, Pa., and Milwaukee.

Rail Strike Delays Tool Orders

Large Equipment Purchases by the Railroads Is Thought Delayed Until Settlement of the Strike—General Buying Still Small Despite Tendency of Tool Prices To Rise—Crane Buying Limited

PURCHASES of machine tools and shop equipment, in the main, continue confined to the bare needs of buyers. Little or no buying for anticipated production is being engaged in and closing of numerous orders are being held up, presumably until after the settlement of the railroad labor trouble. Shop operations are being hindered through a shortage of coal, steel and other raw materials, and despite the advancing prices of machinery, users refuse to purchase equipment until the general industrial situation is on a more even keel. Here and there throughout the country, however, better business is reported in equipment, and on the whole the situation today is considerably improved when contrasted with that existing a few weeks ago.

Settlement of the railroad strike is expected to be followed by the purchasing of large amounts of equipment by the roads. Many of these have had inquiries in the market for months on which little action has been taken, and aside from small purchases of single machines, these needs still are to be filled. In addition to this, buying by the railroads is expected to result in a demand from the general industrial field, such as car and locomotive builders and others who will benefit through a buying movement on the part of the railroads. Some small railroad buying was indulged in last week, the Delaware & Hudson being among the purchasers. Action is expected to be taken within a few days by the Pennsylvania, the Long Island, the Canadian National, the Burlington and the Rock Island railroads, on pending lists.

General industrial buying is not large, purchasers of the past week including the Continental Motors Co., the International Harvester Co., the Universal Portland Cement Co., the General Electric Co. and others.

Crane and allied equipment buying is not large. However, prospects for a live demand for this type of equipment continue to improve as the general business situation clears. During the past week two fairly large crane awards were made, one being by the Lima Locomotive Works, Lima, O., and the other by the Otis Steel Co., Cleveland, the latter company purchasing seven large cranes from the Alliance Machine Works, Alliance, O.

Large Tool Orders Few But Market More Active

NEW YORK, Sept. 12.—The slight improvement noted in machine tool buying last week has subsided. In no case is there a particularly outstanding order, although of some significance has been the buying of a few tools by the Delaware & Hudson railroad and the likely buying within the next day or so of some six or seven tools by the Long Island railroad. Much interest continues to center on the Pennsylvania

Crane Awards and Inquiries of the Week

Orders Placed

Six cranes for the Lima Locomotive Works, Lima, O., to a Michigan crane builder.

One 2-motor 5-ton monorail hoist for the Carnegie Steel Co., Homestead, Pa., to the Shepard Electric Crane & Hoist Co.

One 2-ton hoist for the American Steel & Wire Co., Cleveland, to the Shepard Electric Crane & Hoist Co.

Several small hoists to the Beckwith Machinery Co. for various users in Pittsburgh and other territories to the Shepard Electric Crane & Hoist Co.

One 1-ton hoist to the Fairmont Mining & Machinery Co., Fairmont, W. Va.

One 7½-ton electric crane, 22-foot 6-inch span, for the Hood Rubber Co., Watertown, Mass., to the Milwaukee Electric Crane & Mfg. Co., Milwaukee.

One 5-ton handpower crane, 33-foot span, for the New Britain Water Works, New Britain, Conn., to the New Jersey Foundry & Machine Co., 90 West street, New York.

Three overhead cranes, of 1 and 2 tons capacity, handpower, single motor and 3-motor respectively, for the bureau of yards and docks, Washington, for installation at Pearl Harbor Hawaii, to the New Jersey Foundry & Machine Co., 90 West street, New York.

Two 3-ton pillar cranes for the Third Avenue Railroad Co., New York, to the Chesapeake Iron Works, Baltimore.

One 20-ton handpower crane, 40-foot span, for the Bayway, N. J., plant of the Standard Oil Co. of New Jersey; builder unannounced.

One 7½-ton handpower crane for the Dryden Paper Co., Ltd., Dryden, Ontario; to Northern Engineering Works, Detroit.

Two 5-ton hammerhead cranes for city of Providence, R. I., to Heyl & Patterson, Pittsburgh.

One 2-ton electric overhead crane for the Northwest Paper Co., reported placed by George F. Hardy, 309 Broadway, New York, engineer in charge, with Reading Chain & Block Corp., Reading, Pa.

One 10-ton, 1-motor overhead crane for the Metropolitan Edison Co., Reading, Pa., to the Roeper Crane & Hoist Co., Reading, Pa.

One 5-ton handpower crane for the American Ice Co. New York, to the Roeper Crane & Hoist Co., Reading, Pa.

One 15-ton electric traveling crane for Kewanee Boiler Co., Kewanee, Ill., to the Whiting Corp.

Two 125-ton electric traveling cranes, 97½-foot span, for Chicago, Burlington & Quincy railroad, to the Whiting Corp.

One 10-ton hand power crane for the Boston & Albany railroad, Boston, to the Whiting Corp.

One 20-ton transfer table for the American Car & Foundry Co., Detroit, to the Whiting Corp.

Seven cranes for the Otis Steel Co., Cleveland, consisting of one 175-ton ladle crane with 50-foot span; one 100-ton ladle crane with 80-foot span; one 150-ton stripper with 85-foot span; one 10-ton soaking pit crane with 85-foot span; one 50-ton mill type crane with 85-foot span; one 25-ton slab yard crane with 85-foot span and one 50-ton power house crane with 46-foot span to the Alliance Machine Co., Alliance, O.

Orders Pending

One 10-ton crane or a 5-ton alternative for the Pttsburgh Valve, Foundry & Construction Co., Pittsburgh; bids being taken.

One 25-ton or 30-ton mill type crane for the American Steel & Wire Co., Cleveland; bids being taken.

One each 15-ton, 30-ton with 10-ton auxiliary, 40-ton with 10-ton auxiliary, 10-ton pickling and galvanizing crane and 10-ton crane for the Weirton Steel Co., Weirton, W. Va.; action to be taken early this week.

One 10-ton handpower crane for the J. G. White Engineering Co., New York, pending.

Two 2-ton monorail hoists for the Long Island railroad; it is understood the track will be erected by the company.

Two 150-ton electric overhead cranes, each equipped with 15-ton auxiliary, for a Brooklyn-Edison power plant, New York; Thomas E. Murray, engineer in charge, Duane street, Manhattan, is inquiring for tentative figures.

railroad, which closes bids Sept. 14 on car repair shops at Enola, Pa., and has entered the market for an extensive list of cranes, including many of the heavier type. A list now being figured by some of the sellers in this district calls for complete spring shop equipment and also several machine tools for the Canadian National railroad. Another Canadian list figured here is that of the Canadian Johns Manville Co., Toronto involving a gap lathe, a car wheel press, a shaper, two riveters, and several other machines.

While government stocks, now are not regarded as an important factor in the market, machine tools being brought out by private companies, the majority of whom originally bought the equipment to engage in war work, is having a material effect on the sale of new machines.

Crane demand is listless. While a fair amount of inquiry is coming out, orders are being placed slowly. Of interest was the closing of bids recently on two 5-ton cranes of the hammerhead type for the city of Providence, R. I. Bids of the seven concerns competing, follow: $45,700 Heyl & Patterson, Pittsburgh; $46,000, Bayville Contracting Co., Pittsburgh; $48,350, Wellman-Seaver-Morgan, Cleveland; $66,400, Colby Steel & Engineering Co., Seattle; $69,700, Brown Hoisting Machinery Co., Cleveland; $72,000, McMyler-Interstate Co., Cleveland.

Occasional Large Purchase Reported

PITTSBURGH, Sept. 12.—Notwithstanding the general quietness prevailing in the equipment market, an occasional crane purchase of fairly large proportions or the buying of a single machine tool is recorded. The issuance of machine tool lists by railroads in this territory apparently will be held up until after the labor difficulty is cleared away. The Otis Steel Co. has bought seven cranes from the Alliance Machine Co., Alliance, O., and a blooming mill from the Mackintosh-Hemphill Co., Pittsburgh. The Weirton Steel Co., was scheduled to take action early this week on 65 cranes with two auxiliaries and shortly will close on its eight hot sheet and four cold mills. The Lima Locomotive Works, Lima, O., purchased six cranes from a Michigan crane builder about two weeks ago but so far as reported here has not closed on its eight 6-foot radial drills, one 20-inch by 20-foot axle lathe and four vertical boring mills, one each 20, 36, 42 and 90-inch. A few hoist awards are noted but new inquiries for both cranes and hoists are less numerous than in several weeks past. Included in machine tool sales noted this week in the Pittsburgh area is a 20-inch lathe, a 16-inch motor driven lathe, two shapers and another small lathe. The sale of a slab miller was made in conjunction with a Cleveland dealer who also sold for a Pittburgh dealer a 54-inch boring mill in the Cleveland territory. A West Virginia mine car manufacturer closed on a 12-foot bending brake, ⅜-inch capacity. Several small propositions are up requiring machine tools and the Globe Malleable Iron Co., Syracuse, N. Y., is understood to be preparing a list of equipment for the manufacture of fuel oil engines.

Users Delay Closing on Needs

CLEVELAND, Sept. 12.—Inquiries in the market for machine tools and shop equipment are numerous but dealers report there is considerable hesitancy on the part of users in closing on pending transactions. This hesitancy, it is thought, is brought about through the unsettled conditions arising from labor and transportation troubles. Inability of many plants to obtain sufficient supplies of steel and other raw materials are forcing them to curtail their operations despite the fact orders on their books call for capacity production. In addition to this dealers are having considerable trouble in shipping tools as promptly as buyers desire them. One dealer reports of a sale of several tools to a New England manufacturer, on which delivery took more than seven weeks. Ordinarily these tools should have been delivered inside of one week. Other dealers and manufacturers report like instances.

Included in the fairly sizable inquiries in the market are two on which business is expected to be closed within the next few days. These are the lists of the Lima Locomotive Works, Lima, O., and the Otis Steel Co., Cleveland. Both of these organizations within the past week have closed on their crane requirements. Practically all the other inquiries being worked on here are for one or two machines. Sales of the week involved only single units and most of these were of secondhand equipment. The railroads continue out of the market, with the exception of one or two small inquiries, none from these interests being in the market.

No additional price advances have been noted but before Oct. 1 a number of builders are expected to follow the lead of the Warner & Swasey Co. and several others in advancing prices to meet the higher production costs. Settlement of the railroad labor trouble is expected to be followed by considerable machine tool buying as many users fear higher prices are inevitable and are only delaying their purchases at this time because of the unsettled industrial conditions.

Tool Prices Are Advancing

CHICAGO, Sept. 12.—Price advances continue to be made in the machine tool industry. A Cincinnati manufacturer of milling machines will advance prices Sept. 15 from 10 to 15 per cent. A manufacturer of shapers at the same city has given notice that on Oct. 1 it will return to its former list, which will add 20 per cent to the present schedule.

Buying by the railroads has not continued, but some machinery is being taken on lists which have been current for a long time. The Santa Fe railroad placed orders for two milling machines and a boring mill, which were not covered when they bought most of their list a short time ago. The Burlington road has not yet placed any business on its pending list. The Rock Island railroad is nibbling and has asked confirmation of quotations made on the list it issued several months ago. The Studebaker Corp. appears to have covered its requirements for the present. The Continental Motors continues to buy a few tools occasionally instead of issuing a list. The Universal Portland Cement Co. recently placed orders for four tools for its plant at Buffington, Ind. The International Harvester Co. is buying some special machines.

Volume of Sales Is Larger

BOSTON, Sept. 12.—Industrial activity in New England continues to improve and along with it is a better demand for machine tools. A large portion of the local demand, however, is being supplied from stocks of used equipment. One manufacturer during the week with a list calling for six tools, bought five secondhand machines and but one new one. Dealers handling secondhand equipment nearly all report a fairly large turnover since the first of September. A definite improvement in demand for new tools is confirmed, however, by New England manufacturers, nearly all of whom report sales in September at a better rate than in August. One manufacturer reports $100,000 of new tool business already entered in September, against total sales in August of $60,000. Demand comes from railway repair shops, general repair shops, automotive part manufacturers, and the textile industry principally, with scattered inquiry in nearly all lines. In addition to this vocational schools offer a fairly attractive demand for cheaper grades of machines. The General Electric Co.

at Lynn is taking renewed interest in a list of tools which has been out for some time. An eastern Massachusetts manufacturer is in the market for a large lathe and two radial drills. A Cambridge, Mass., repair shop is in the market for two grinding machines; a large planer is wanted by a Bridgeport, Conn., shop; the Viscoloid Co., Leominster, Mass., is in the market for lathes and other equipment.

Interest in Equipment Reviving

TORONTO, Ont., Sept. 12.—Demand for machine tools is improving and while sales still are confined to one or two units inquiries call for some fairly large lists. More interest in tool requirements for replacement purposes is being shown and during the past week or two orders for machinery and tools on this account was more pronounced. While the Canadian railways have been out of the market for some time dealers look for a resumption of buying both from the Canadian Pacific railway and the Canadian National railway. Inquiries for equipment for new plants and additions which are nearing completion are coming out. In the mining field better conditions are appearing and more extensive buying from this quarter is expected. Demand for pulp and paper equipment has been good. The Waterous Engine Works, Brantford, Ont., is operating from 75 to 80 per cent on pulp mill equipment. Woodworking equipment demand continues active. Small tool orders are about the same as during past weeks. Buying is steady and prices are holding.

C. Alfred Maguire, chairman of the board of control, Toronto, Ont., will receive bids until Oct. 3, for the supply and installation of two 2,880,000 gallon centrifugal sewage pumps and motors. Graves, Bigwood & Co., Bank of Hamilton building, Toronto, Ont., will require equipment for a box factory. The Art Craft Furniture Co., Goodrich, Ont., will remodel factory and install additional equipment. The National Castings, Ltd., Belleville, Ont., is installing an electric furnace, and new core ovens as well other equipment. Extensions and improvements are underway at the plant of the Electric Steel & Metals, Ltd., Welland, Ont. Progress is being made on the erection of a building at the plant of the Durant Motors of Canada at Leaside, Ont. The Anaconda American Brass Co., New Toronto, Ont., A. H. Quigley, general manager, plans a foundry. The Hull Electric Co., 117 Main street, Hull, Que., will erect a power plant. The Lower St. Lawrence Power Co., Rimouski, Que., will erect a power plant.

Equipment Demand Is Improved

MILWAUKEE, Sept. 12.—The lull in metalworking machinery business during most of the past month appears to have been of a temporary nature, because in the past 10 days orders have been more frequent and inquiries greater and of a more promising nature. The character of business remains unchanged, it coming from scattering sources and in small dabs. An order for more than one or two machines is exceptional. Automobile shops have been buying milling machines at a fair rate, but taking only one or two at a time. One development of decided interest is the entrance of agricultural machinery makers into the tool market, although as yet only on a small scale.

Upward revision of tool prices has not caused any particular buying excitement, it is said here. Metalworking shops are buying only as much and as often as their needs require and few if any are anticipating requirements although an active fall and winter season is assured. This consumptive buying tendency, on the other hand, is believed to presage a good trade all winter.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

BESSEMER, ALA.—The Nashville Bridge Co. is reported planning to establish a fabricating plant here.

PLAINVILLE, CONN.—Plans have been prepared for a plant addition by the Standard Steel Bearings Co. Inc.

HARTFORD, CONN.—Bids have closed for a 1-story, 50 x 65-foot factory addition for the M. S. Little Mfg. Co.

HARTFORD, CONN.—The Electric Supply & Equipment Co. this city, will start work shortly on a $50,000 plant at Albany, N. Y. The structure will be 4-stories, 40 x 60 feet.

DAWSON, GA.—Plans are being prepared for rebuilding the plant of the Dawson Variety Works Co.'s machine shop, which was recently damaged by fire.

CHICAGO—The Atlas Copper & Brass Mfg. Co., 3740 High street, has let the contract for a 1-story machine shop, 50 x 123 feet.

CHICAGO—The plant of the A. M. Castle Steel Co., 1300 North Branch street, recently was damaged by fire.

CHICAGO—The Chicago Crane & Hoist Co., 3828-42 North Kilbourne avenue, has been incorporated with $20,000 capital stock by Timothy J. Fell, 1112, 133 West Washington street.

CHICAGO.—The Barrett Roofing Co., 5727 Madison street, has been incorporated with $2500 capital stock by A. S. Barrett, E. S. Stuart and Edward E. Williams.

CHICAGO.—The C. & P. Mfg. Co., 630 South Wabash avenue, has been incorporated with $5000 capital stock to manufacture washing machines, etc., by W. G. Beasley, E. L. Wright and M. P. Phillips.

CHICAGO—The Fulton Machine Co., 1525 Dayton avenue, has been incorporated with $25,000 capital stock by Charles F. Goedke, Edward J. Whelan and Franklin Raber. The company is represented by Franklin Raber, 76 West Monroe street.

CHICAGO.—The Midwestern Tool Co., 4750 Broadway, has been incorporated with 100 shares of no par value by Al Stalker, Carl O. Swenson, Kenneth M. Joslyn, T. R. Swenson and Samuel R. Swenson. The company is represented by Ernest A. Eklund, 4750 Broadway.

CHICAGO—The Mid-City Auto Body & Wagon Works, Inc., 401 North Morgan street, has been incorporated with $25,000 capital stock by Leo L. Gardner, J. W. Singleton and Marshall Reagen. The company is represented by Maximilian St. George, 108 South La Salle street.

CHICAGO.—The American Bascule Bridge Corp., 501, 230 South Dearborn street, has been incorporated with $25,000 capital stock by H. C. Rumery, Walter G. Mueller and L. A. Rumery. The company is represented

CINQUANTE-SIXIÈME ANNEE, N° 124 10 MAI 1922

Revue Industrielle

Organe de Defense et d'Expansion
de l'Industrie et du Commerce

Le pouvoir d'achat des salaires dans l'industrie américaine

Une personnalité du monde industriel américain, M. W. Alexander, écrit l' « Iron Trade Review » du 21 avril, a présenté à l'Association Nationale du Commerce des Métaux un rapport dont nous extrayons les considérations qui suivent :

Si l'on compare les salaires horaires moyens de 1914 et de 1921 dans l'industrie mécanique, on constate que le salaire de juillet 1921 était de 114 % supérieur à celui de 1914. Tenant compte du facteur « pouvoir d'achat du salaire » il s'avère qu'en juillet 1921 la redevance payée donnait à l'ouvrier un pouvoir d'achat de 32 % supérieur à celui dont il jouissait en 1914.

En janvier 1922 sa capacité d'achat était

Revue Industrielle, published at Charleroi, France, is "the organ of defense and expansion of industry and commerce", one of the leading newspapers in the country devoted especially to the purpose.

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PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

by H. C. Rumery, 203 South Dearborn street

BIRMINGHAM, ALA.—The Birmingham Stove & Range Co. plans expansion of its plant.

MOBILE, ALA.—The Modern Truck Mfg. Co. has been incorporated with $50,000 capital stock by G. M. Byrde, M. L. Scholtes and E. A. Hill.

NEW BRITAIN, CONN.—The Russell & Erwin Mfg. Co., branch of the American Hardware Corp. has let the contract for the erection of a brick, 1-story, 20 x 50-foot factory addition.

NEW HAVEN, CONN.—The Sam Schwarts Co., Inc., has been incorporated to deal in machinery with $50,000 capital by Sam Schwarts, R. S. May and M. E. Bailey.

ROCKY HILL, CONN.—The Connecticut Foundry Co. has let the contract for the erection of a brick, 1-story, 40 x 100-foot foundry addition.

TALLAHASSEE, FLA.—The Hill City Mfg. & Machine Co. has been incorporated with $10,000 capital stock by A. Wahnish, George B. Stein and others.

CHICAGO—The Sloan Valve Co., 4300 West Lake street, plans the erection of a 1-story plant addition.

CHICAGO—The F. H. Smith Mfg. Co., 3047 Carroll avenue, plans the erection of a 2-story factory building.

PERU, ILL.—The W. H. Maze Co., maker of metal specialties, plans 1-story addition, 75 x 140 feet to cost about $60,000.

ROCKFORD, ILL.—Stephen Wolff, Inc., Buchanan and Loomis streets, has been incorporated with $25,000 capital stock to operate a machine shop and foundry by W. A. Stephen, F. J. Wolff and others. The company is represented by David D. Madden, Ashton building.

FAIRMOUNT, IND.—The Graham Glass Co. plans extensions and improvements to its plant.

LOUISVILLE, KY.—The plant of the American Car & Foundry Co. recently was damaged in a storm.

LOUISVILLE, KY.—W. C. Heimerdinger Co., metalworking, has been incorporated with $150,000 capital stock by W. C. Heimerdinger and Edward White.

BALTIMORE—The J. W. Neely Co. has been organized to manufacture and deal in marine hardware, etc., by W. H. Neely, Ernest Neely and Joseph W. Neely.

HAGERSTOWN, MD.—Announcement has been made by the Potomac Public Service Co., control of which was recently acquired by the American Water Works & Electric Co.,

BOSTON—The American Metal Parts Co. has been incorporated with 10,000 shares without par value by James H. Bowditch, Joseph Bornstein and Arthur S. Guy.

BOSTON—The McIver Import & Export Co., Inc., has been incorporated to deal in machinery with $125,000 capital by George E. O'Neil, Arlington, Mass., George W. McIver, New York, and Harold W. Neville, Cambridge, Mass.

BOSTON—The Perkins-Carpenter Electric Supply Co., has been incorporated to deal in machinery and appliances with $100,000 capital by L. Fred Sanborn, Oscar H. Perkins, Danvers, Mass., Ernest H. Carpenter Medford, Mass., and Francis L. Maguire, Arlington, Mass.

CAMBRIDGE, MASS.—The University Salvage Co. has been incorporated to salvage metals with $50,000 capital by A. Jerome Thorner, Harry Bromberg and Samuel Friedman, Winthrop, Mass.

LOWELL, MASS.—The Hamilton Mfg. Co. has let the contract for a hydroelectric plant.

WORCESTER, MASS.—The Worcester Electric Tool Co. has been incorporated with $100,000 capital by Howard P. Gleason, Axel G. Sandberg and Carl D. Wilder.

WILLIAMSPORT, PA.—Work will be started shortly on a steam power generating plant here.

FILER CITY, MICH.—The Filer Fibre Co. has awarded a contract for the erection of an addition to its plant, 2-stories, 72 x 420 feet.

MARYSVILLE, MICH.—The Wills-Saint Claire Co. plans the erection of additions to its plant.

GLENRIDGE, N. J.—The Comfo Electric Iron Co. has been incorporated with $150,000 capital stock by D. Trevor Lewis, B. M. Bancroft and Henry Amerman.

NEWARK, N. J.—Work will be started shortly by the J. S. Mundy Hoisting Engine Co. on a 1-story plant addition, 40 x 100 feet.

EATONTOWN, N. J.—The New Jersey Brick Co., Inc., has been incorporated with $50,000 capital stock by E. A. H. Watson, Walter T. Spalding and Theobald Mincer.

BOLIVAR, N. Y.—The Bolivar, Richburg Electric Co. contemplates a $30,000 plant addition.

BROOKLYN, N. Y.—The Queens Borough Gas & Electric Co., 347 Central avenue, plans a 2-story electric power house.

DUNKIRK, N. Y.—The Skelton Shovel Co. plans a plant here at an estimated cost of $135,000.

BROOKLYN, N. Y.—The Pennsylvania Products Laboratories, Inc., has been incorporated to manufacture chemicals, etc., with $25,000 capital stock by C. Jacob, B. Miller and A. Devine. The company is represented by F. G. Milligan, 375 Fulton street.

NEW YORK—The Harlem Cork Co., care of L. A. Cuvillier, 154 East 121st street, has been incorporated with $5000 capital stock by S. Becker, A. H. and C. F. Stahl.

NEW YORK—The Sutwa Mfg. Co. has been incorporated to make hangers, etc., with $100,000 capital stock by M. G. Newman, D. M. Meyers and C. Weil. The company is represented by Strongman & Ward, 256 Broadway.

NEW YORK—The B. Randolph & Co. has been incorporated to make devices with $5000 capital stock by B. Avery, J. E. Whiting and J. O. Castell and others. The company is represented by Avery & Whiting, 5 Nassau street.

NEW YORK—H. O. Boehme has been incorporated to make metallic compounds with $25,000 capital stock by H. O. Boehme, and K. Braun. The company is represented by P. C. Schnitzler, 35 Nassau street.

ROCHESTER, N. Y.—The Master Chemical Co. has been incorporated with $10,000 capital stock by L. and P. S. Burnherr and S. R. Joffe, to manufacture chemicals, etc.

SYRACUSE, N. Y.—The Hayes Brass Foundry has been incorporated with $5000 active capital stock by C. H. Hayes, V. Adler and J. Whitbread. The company is represented by W. Van Duyn.

CHARLOTTE, N. C.—The Saco Lowell Shops have awarded contracts for the erection of a plant.

HIGH POINT, N. C.—The Marietta Paint & Color Co. has plans under way for the construction of a 4-story plant building here.

AKRON, O.—The P. E. Welton Engineering Co. has been incorporated with $50,000 capital stock by P. E. Welton, W. C. Workman, H. E. Welton, George H. Wadsworth and E. R. Bond.

CLEVELAND—The Automobile Electric Co. has been incorporated with $500 capital stock by T. D. Lamb, F. M. Conley, P. M. Kuederle, S. D. Dodge and E. M. Court.

CLEVELAND—The Lyman Mfg. Co. has been incorporated with $1000 capital stock by Kent E. Lyman, A. G. Lyman, M. L. Hogan, D. D. Hurlbut and others.

CLEVELAND—The Combustion Appliance Co. has been incorporated with $10,000 capital stock by Stanley R. Hardwick, Willis L. Holloway, Gus W. Peterson, Louis B. Eifert and B. A. Buonpane.

CLEVELAND—The Goble Rubber Products Co. has been incorporated with $50,000 capital stock to manufacture rubber specialties, etc., by H. L. Indal Smith, M. L. Merchant and J. M. Whitford.

IRONTON, O.—The Ironton Boiler Works, Inc., has been incorporated with $50,000 capital stock by Patrick Meehan, James L. Meehan and others.

ALLENTOWN, PA.—The Boiler & Radiator Corp. has been incorporated with $10,000 capital stock to manufacture boilers, radiators, etc., by Homer Adams, James F. Swartz and others.

EAST STROUDSBURG, PA.—The Shawana Steel Construction Co. has been incorporated with $10,000 capital stock to manufacture steel cars, cranes, trucks, etc., by L. D. Sopher, Harry Olldorf and Paul S. Pullinger.

FRANKLIN, PA.—The Mercer Refining Co. has been incorporated with $75,000 capital stock by Merrill B. Hastings, Wayne C. Hastings and A. H. Tennent.

PHILADELPHIA—The Somerton Foundries Corp., care of the Capital Trust Co. of Delaware, Dover, Del., recently was incorporated with $250,000 capital stock by M. F. Devine, S. R. Kerr and C. L. Hadgkiss.

PHILADELPHIA—The Red Diamond Chemical Co. has been incorporated with $100,000 capital stock by Samuel S. Sadtler, Stenton avenue, Chestnut Hill, Philadelphia, Charles C. Benton, 5454 Baltimore avenue, and Walter Moses, 29 West Tulpocken street.

CENTERDALE, R. I.—The Chapman Products Co. has been incorporated with $25,000 capital stock to manufacture chemical products, etc., by M. L. Merithew, R. S. Thorton and E. B. Chapman, 131 Greenville avenue, Manton, R. I.

PROVIDENCE, R. I.—The Interstate Chemical Co. has been incorporated with $5000 capital stock to manufacture chemicals, etc., by P. C. Joslin, R. A. McDonald and Thurston Seabury.

CHATTANOOGA, TENN.—The Casey Hedges Co. has acquired 45 acres on which it plans a boiler and plumbing supply plant.

RICHMOND, VA.—The Richmond Pressed Metal Works, Inc., has let a contract for the erection of a plant building to be erected at an estimated cost of $25,000.

CABELL COUNTY, W. VA.—The Barboursville Water & Light Co. has been incorporated by H. E. Love, R. E. Love, A. E. May, William F. May, W. G. Shipe and others.

FAIRMONT, W. VA.—The Domestic Coke Corp. recently increased its capital stock from $3,500,000 to $4,500,000 and plans expansion of its plant.

MILLVILLE, W. VA.—The Potomac Public Service Co. plans to install additional equipment in its plant.

PARKERSBURG, W. VA.—The General Porcelain Co. will erect a 1-story plant addition, 65 x 225 feet at an estimated cost of $20,000.

MILWAUKEE—The American Malt & Grain Co. has sold its extensive buildings to the Rissman-Levey Salvage Co., 93 South Water street. Some of the buildings will be remodeled.

MILWAUKEE—The Stein Construction Co., 204 Grand avenue, has been awarded the contract to build a reinforced concrete span across the Menominee river.

IRONDEQUOIT, N. Y.—The General Tool, Die & Radio Co. has been incorporated with $25,000 capital stock by F. L. Smith, A. R.

AIRCO
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ANYTHING AND EVERYTHING
FOR OXYACETYLENE WELDING AND CUTTING

SERVICE

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AIRCO OXYGEN
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The Air Reduction Sales Company is the largest manufacturer and distributor of a complete line of gases, apparatus, supplies, and specially designed machines for oxyacetylene welding and cutting.

Two of the most important units in the comprehensive list of Airco and Airco-Davis-Bournonville products are Airco Oxygen and Airco Acetylene.

Specifying "Airco" when ordering oxygen or acetylene is simply expressing confidence in a time-tested standard of excellence.

Supporting this standard are two business-building essentials—

First, a carefully-planned, nation-wide system of plant and warehouse distribution which insures up-to-the-minute deliveries for either steady or emergency consumption.

Second, the specialized engineering skill of an Advisory Service Staff which offers to all Industry constructive solutions of welding and cutting problems.

Write for Airco booklet:

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AIR REDUCTION SALES COMPANY

Manufacturer of Airco Oxygen — Airco Acetylene — Airco-Davis-Bournonville Welding and Cutting Apparatus and Supplies, Acetylene Generators, and Specially Designed Machines for Automatic Welding and Cutting — Nitrogen, Argon and other Airco Atmospheric Gas Products.

Controls the manufacture and sale of National Carbide

Home Office: 342 Madison Avenue, New York, N. Y.

Airco District Offices, Plants and Distributing Stations conveniently located throughout the Country.

"Airco Oxygen and Acetylene Service is Good Service."

Sierka and A. Felerski. The company is represented by Zimmerman & Felerski.

JAMESTOWN, N. Y.—Plans have been prepared by the Watson Mfg. Co. for a 4-story plant addition, costing $25,000. The company manufactures steel screening.

NEW YORK—The Car Lighting & Power Co. plans plant construction and expansion.

NEW YORK—Work will be started shortly on a $200,000 garage for H. Harjes, 408 West Seventy-sixth street.

NEW YORK.—The Kewanee Boiler Co., 47 West Forty-second street, this city, plans two 1-story buildings, each 24 x 50 feet.

NEW YORK—The New York Air Brake Co., 165 Broadway, plans extensions and improvements to its plant.

NEW YORK.—A $100,000 garage will be erected here for J. Pearlbinder, plans are being prepared by C. Kreymborg, architect, 2534 Marion avenue.

NEW YORK.—The Thomas Pump Works has been incorporated with $20,000 capital stock by G. W. O'Dell, J. J. Lang and J. Greenspan. The company is represented by H. G. Fromberg, 320 Broadway.

NEW YORK.—The Joseph Van Blerck Engine Corp. has been incorporated with $75,000 capital stock by J. Van Blerck, F. B. Sexton and B. Pollak. The company is represented by S. B. Pollak, 53 Park Row.

NEW YORK.—The Peerless Sheet Metal Works has been incorporated with $15,000 capital stock by L. L. Gaffein, L. Lipshitz and M. Heyert. The company is represented by A. Heyert, 5 Beekman street.

OGDENSBURG, N. Y.—The Fruitland Iron Ore Co. has been incorporated with $10,000 capital stock by J. P. Ehrhart, C. K. Williams and R. P. Wells. The company is represented by J. C. Tulloch, attorney.

ROCHESTER, N. Y.—The Sill Stove Works, Inc., 524 Oak street, plans a 1-story plant addition.

ROCHESTER, N. Y.—Bids were opened Sept. 9 by William Steele & Sons Co., Philadelphia, for a factory here for the Electric Storage Battery Co.,

UTICA, N. Y.—The Utica Heater Co. plans the erection of a plant building at an estimated cost of $100,000. It will be 52 x 152 feet.

UTICA, N. Y.—A $100,000 addition will be erected at the service and repair works of the Utica Motor Car Co. Linn Kinne is architect.

WATERTOWN, N. Y.—Watertown Parts Corp. has been incorporated to make automobile parts with $10,000 capital stock by M. A. Gilligan, A. Morris and T. Laidlaw. The company is represented by State & Larmouth, attorneys.

GREENBORO, N. C.—W. H. Chapman, 840 West Market street, plans to establish a plant for the manufacture of drain tile, etc.

LEXINGTON, N. C.—The Lexington Hardware Corp. has been incorporated with $100,000 capital stock by J. V. Moffit and others.

AKRON, O.—The Akron Signal Co. has been incorporated with $2500 capital stock by A. C. Littell, S. D. Stanson, W. J. Miles, Ben W. Holub and E. K. Button.

CLEVELAND.—The Combustion Appliance Co. has been incorporated with $10,000 capital stock by Stanley R. Hardwick, Willis L. Holloway, Gus. W. Peterson, Louis B. Eifert and B. A. Buonpane.

NASHVILLE, TENN.—The Standard Machine Co., 311 Fifth avenue, plans to erect a 2-story machine shop at an estimated cost of $5000.

RAVENNA, O.—Frank W. Phillips, Cleveland, plans to establish a plant here for the manufacture of special automobile bodies. It will be located in the partially completed buildings of the McElrath Tire & Rubber Co.

TOLEDO, O.—The Rollaway Motors Co. plans the erection of a plant addition.

YOUNGSTOWN, O.—The National Lamp Works of the General Electric Co. plans a factory building here at an estimated cost of $75,000.

YOUNGSTOWN, O.—The Youngstown Boiler & Tank Co. plans plant addition at an estimated cost of $50,000.

YOUNGSTOWN, O.—The Youngstown Steel Co. has awarded a contract for structural steel work to the American Bridge Co. for its proposed mechanical puddling plant at Warren, O.

CARBONDALE, PA.—S. D. Chandler, 82 Main street, plans a 3-story automobile service and repair works.

CHESTER, PA.—The Scott Paper Co. contemplates an addition to its plant, which will cost, including equipment, approximately $300,000.

CONNELLSVILLE, PA.—The Pennsylvannia Road Machinery Co. has been incorporated with $25,000 capital stock by W. J. Doorley, James J. Daugherty and J. D. Porter.

LANCASTER, PA.—The Monitor Bi-Loop Radiator Co. will start work soon on a plant addition.

MEADVILLE, PA.—The Meadville Iron Co. plans a 1-story addition, 60 x 88 feet.

OIL CITY, PA.—The National Transit Pump & Machine Co. plans a 1-story foundry, 80 x 200 feet.

PHILADELPHIA—A $100,000 garage will be erected here by Henderson Bros. The structure will be 1 and 2-stories.

PHILADELPHIA—Plans have been prepared for a warehouse for the Pennsylvania & Reading railroad. Samuel T. Wagner is architect.

PHILADELPHIA—The Wilmot Fleming Iron & Steel Co. has been incorporated with $50,000 capital stock by Wilmot Fleming, Paul E. Good and Joseph K. Carr.

PHILADELPHIA—The Ra-do Radiator & Sales Corp. has been incorporated with $35,000 capital stock by Robert C. Powell, Edwin J. White and Charles E. Middleton.

PHILADELPHIA.—Plans are being prepared by Norman Hulme, architect, for a factory and boiler house, for the L. H. Gilmer Co.

PHILADELPHIA.—Bids will be closed Sept. 14 on car repair shops at Enola, Pa., for the Pennsylvania railroad. A. C. Shand is engineer.

PHILADELPHIA.—A $120,000 service station will be erected here by Joseph J. Greenberg. The structure will be 5-stories. Percival M. Sax has the general contract.

PHILADELPHIA.—General contract has been awarded to F. L. Hoover & Sons for a $110,000 sub-station for the Philadelphia Electric Co. The structure will be 2-stories, 59 x 122 feet.

PITTSBURGH—The Standard Seamless Tube Co., 313 Sixth avenue, plans a 1-story plant addition.

PITTSBURGH—The D. N. Carlin Co., 125-27 Dennison avenue, maker of toys, etc., plans a plant addition.

PITTSBURGH—The Pittsburgh Box Co. has been incorporated with $30,000 capital stock by J. C. Robinson, F. E. Robinson and W. B. McVicker.

SCRANTON, PA.—Part of the plant of the Scranton Electric Steel Co. recently was damaged by fire. It will be rebuilt.

PAWTUCKET, R. I.—The H. & B. American Machine Co. is to erect a 1-story addition at a cost of $125,000.

PROVIDENCE, R. I.—The Dover Machinery Co. has been incorporated with 500 shares without par value by Henry E. Watjen, Harold P. Watjen and Henry A. Goodrich, East Providence, R. I.

RICHMOND, VA.—The Richmond Pressed Metal Works has increased its capital stock to $150,000.

APPLETON, WIS.—A factory, 40 x 200 feet, two stories, is being completed by the Scolding Locks Hairpin Co. at Appleton Junction. It manufactures hairpins and other wire toilet articles.

APPLETON, WIS.—Martin Boldt & Sons were the successful bidders for building a 2-story fireproof garage and machine shop, 80 x

(*Continued on Page* 748)

Business Changes Recently Announced

APPOINTMENT of the Commercial Steel & Supply Co., Plymouth building, Cleveland, as the company's represenative in the Cleveland district, is announced by the Illinois Tool Works, 154 East Erie street, Chicago.

* * *

A. T. Doud has acquired the Precision & Thread Grinder Mfg. Co., 1 South Twenty-first street, Philadelphia.

* * *

A branch office has been opened at 1022 Sassafras street, Erie, Pa., by the Laughlin-Barney Machinery Co., Union Arcade building, Pittsburgh.

* * *

E. Corey & Co., Portland, Me., iron and steel, have moved into new quarters at 59-89 West Commercial street.

* * *

Detroit offices of the Weirton Steel Co. have been moved from 2032 Dime Bank building to 9-259 General Motors building.

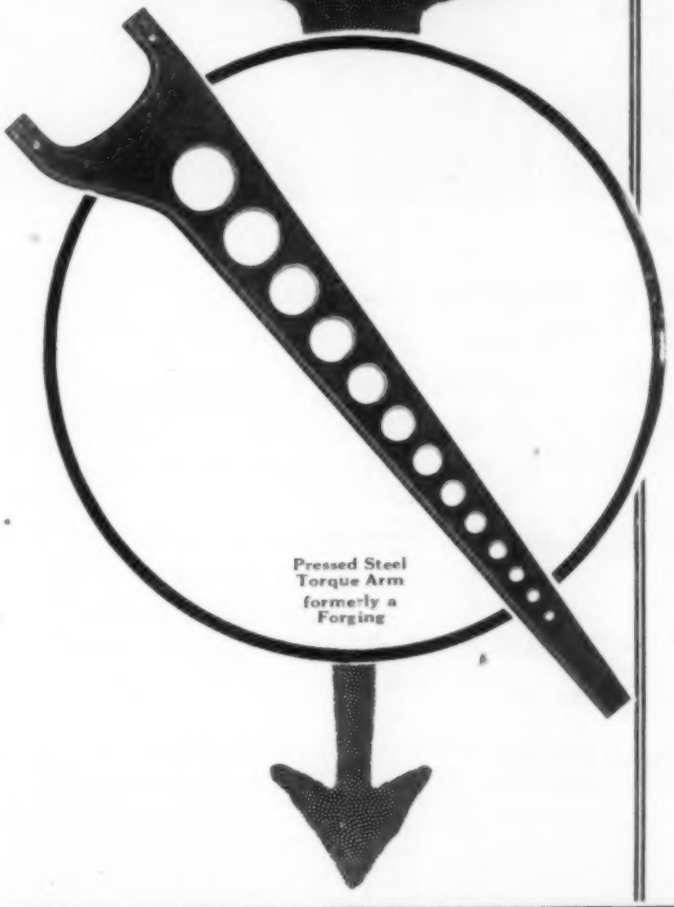
* * *

The Sanford Riley Stoker Co., and the Murphy Iron Works have moved from 233 Broadway, New York, to 607 Terminal building, 103 Park avenue, New York.

* * *

The Westfield Machine Co., Westfield, Mass., has expanded its facilities for the manufacture of radio supplies and changed its name to the Westwyre Radio Co.

LESS BRITTLE THAN CASTINGS



Parish & Bingham Pressed Steel Parts are much less brittle than castings—therefore they are much more reliable and durable.

A few more of their superiorities over castings are: they are stronger, tougher, lighter in weight, more uniform in weight, more uniform in shape,—and far cheaper in cost than castings. Also, when you get them they are completely finished—there is absolutely no machining to do.

Perhaps you have some part with which we may assist you right now—or at least, don't fail to get in touch with us at once when you have a new part to design. Parish & Bingham Engineers are specialists in designing suitable pressed steel substitutions for castings. *Let them help you.*

A few of the Hundreds of Parts we can make for you — Brake Drums; Axle Housings; Running Boards; Engine Pans; Hub Flanges; Axle Housing Covers; Torque Arms; Battery Supports; Lathe Pans; Tire Carriers; Running Board and Step Hangers; Pressed Steel Commercial Car Wheels; Light Railroad Stampings; Agricultural Implement Parts, etc.

Parish & Bingham Corporation

Builders of Automobile Frames and Steel Stampings

CLEVELAND, OHIO

P&B

PARISH & BINGHAM Pressed Steel Parts

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron..$5.95
Mesabi Bessemer, 55 per cent iron..... 5.70
Old Range nonbessemer, 51½ per cent iron 5.20
Mesabi nonbessemer, 51½ per cent iron 5.05

PORT HENRY IRON ORE
Per Gross Ton, F.o.b., Port Henry

Old bed 21 furnace.....$4.50
Old bed concentrates, 63 per cent..... 5.25
Harmony, cobbed, 63 per cent..... 5.25
New bed, low phos., 65 per cent..... 7.50
Lump ore for fix..... 6.00

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, 29½ cents per unit.

Indian 48 to 50 per cent c.i.f. Atlantic ports, nominal.

Caucasian, 52 per cent, c.i.f. Atlantic ports, 29 cents per unit.

Fluor Spar

Washed gravel, Kentucky and Illinois mines, per ton.....$16.00 to 17.50

Rivets

Structural rivets, Pittsburgh.. 3.00c
Boiler rivets, Pittsburgh..... 3.10c
Rivets, ⅞-inch and smaller.... 65-5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1⅜ inches inclusive)

Hot pressed square or hexagon blank or tapped .....$3.75 off list
Cold punched square or hexagon blank or tapped .....$3.75 off list
Cold punched semifinished hexagon nuts ½-inch and larger.....75 off
Cold punched semifinished hexagon nuts ⅜-inch and smaller.....80 off
Case hardened, finished, hexagon....65-5 off
Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
⅜ x 6 inches, smaller and shorter

Rolled thread .....50-10-10 off
Cut thread .....50-10 off
Larger and longer.....50-10 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60-10 off
Cut thread .....50-10-10 off
Larger and longer.....50-10-10 off
(⅜ x 4 inches, cold punched nuts)
Cut thread .....45-10 off
Larger and longer.....45-10 off
Lag screws .....60-10 off
Plow bolts Nos. 1, 2 and 3 heads .....50-10 + 20 off
Tap bolts .....30 off
Bolt ends with hot pressed nuts..50-10-10 off
Bolt ends with cold punched nuts...45-10 off
Blank bolts .....50-10-10 off
Rough stud bolts with nuts.....45-10 off

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

Butt Weld	Black	Galvanized
⅛-inch	51½	26
¼ and ⅜-inch	57	31½
½-inch	62	48½
¾-inch	66	54½
1 to 3-inch	68	56½
Lap Weld		
2-inch	61	49½
2½ to 6-inch	65	53½
7 to 8-inch	62	49½
9 to 12-inch	61	48½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	66	54½
Lap Weld		
2-inch	59	47½
2½ to 6-inch	63	51½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	47½	31
¼ and ⅜-inch	53	36½
½-inch	59	48½
¾-inch	64	53½
1 to 1½-inch	66	55½
2 to 3-inch	67	56½
Lap Weld		
2-inch	59	48½
2½ to 4-inch	63	52½
4½ to 6-inch	62	51½
7 to 8-inch	58	45½
9 to 12-inch	52	39½

DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	48	38½
¾ to 1½-inch	51	41½
2 to 2½-inch	53	43½
Lap Weld		
2-inch	47	38½
2½ to 4-inch	49	40½
4½ to 6-inch	48	39½
7 to 8-inch	44	31½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS		
Butt Weld	Black	Galvanized
⅛ and ¼-inch	+ 1½	+27½
⅜-inch	31½	13½
½-inch	37½	22½
1 to 1½-inch	39½	24½
Lap Weld		
2-inch	34½	20½
2½ to 6-inch	37½	24½
7 to 12-inch	35½	22½
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
⅛ and ¼-inch	+ 9½	+42½
⅜-inch	30½	18½
½-inch	37½	23½
1 to 1½-inch	39½	25½
Lap Weld		
2-inch	35½	22½
2½ to 4-inch	38½	26½
4½ to 6-inch	37½	25½
7 to 8-inch	30½	18½
9 to 12-inch	25½	13½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+32	+44
¾-inch	+12½	+24½
1-inch	+28½	+40½
1¼-inch	+12½	+24½
1½-inch	+11½	+23½
Lap Weld		
2 and 2½-inch	2½	+ 9½
3 to 4-inch	7½	+ 1½
4½ to 6-inch	6½	+ 2½
8-inch	3½	

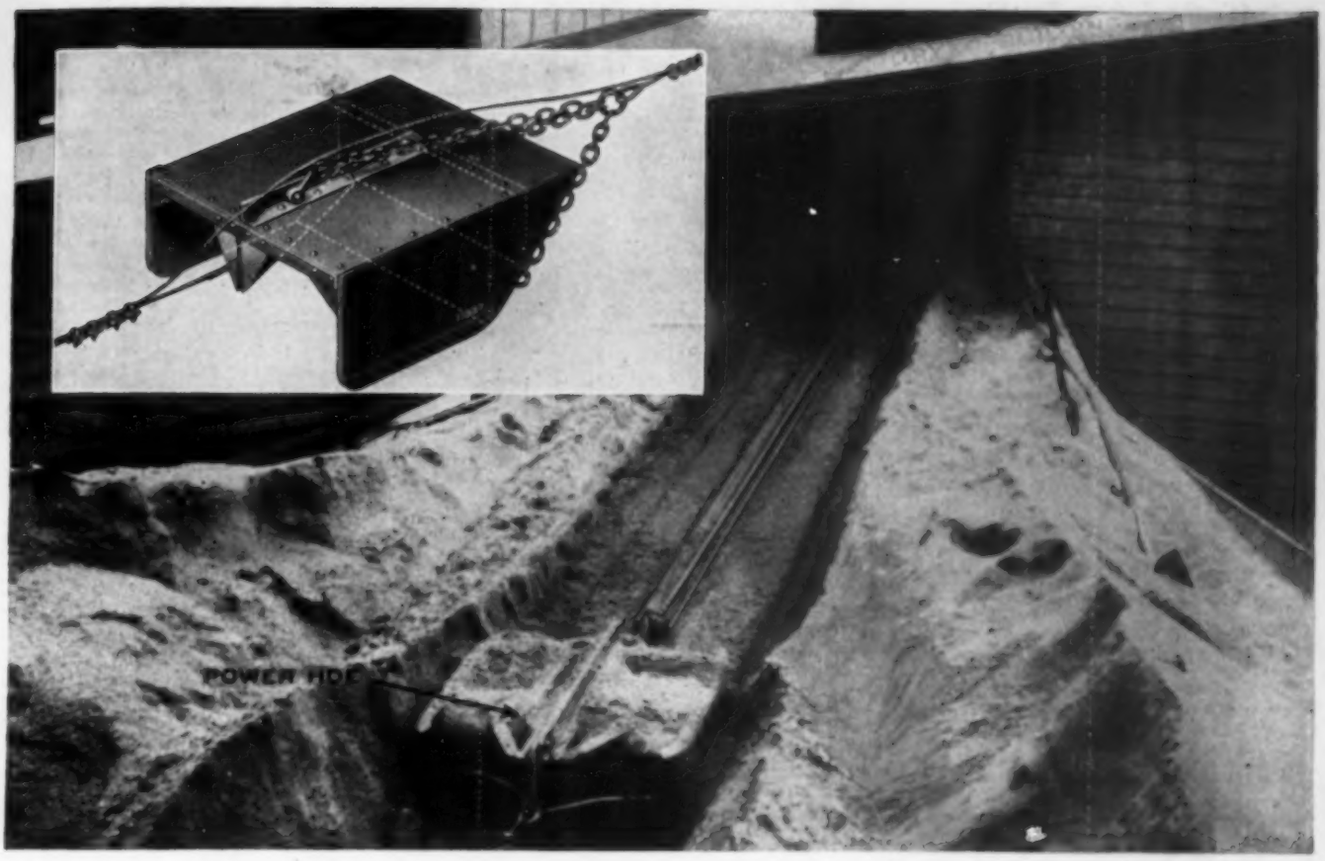
Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL	
1¾-inch	19½
2 and 2¼-inch	34
2½ to 3-inch	45
3¼ to 4-inch	50
CHARCOAL IRON	
1½-inch	2
1¾-inch	4
2 and 2¼-inch	14
2½ to 3-inch	19
3¼ to 4½-inch	21
SEAMLESS COLD DRAWN	
1-inch	53
1¼ and 1½-inch	45
1¾-inch	39
2 and 2¼-inch	32
2½ and 2¾-inch	36
3-inch	40
3½ to 4-inch	45
4½ and 5-inch	37
SEAMLESS HOT ROLLED	
3-inch	42
3½ to 4-inch	47

Warehouse Prices

STEEL BARS	
Boston	3.25c
Buffalo	2.95c to 3.00c
Chicago	2.80c
Cincinnati	2.95c to 3.10c
Cleveland	2.81c
Detroit	2.90c
New York	2.94c
Philadelphia	2.90c
San Francisco	3.40c
Seattle	3.50c
St. Louis	2.90c
St. Paul	3.05c
Los Angeles	3.50c
IRON BARS	
Boston	2.75c
Buffalo	2.95c to 3.00c
Chicago	2.80c
Cincinnati	3.10c
Detroit	2.90c
New York	2.83c
Philadelphia	2.90c
St. Louis	2.90c
SHAPES	
Boston	3.35c
Buffalo	3.05c to 3.10c
Chicago	2.90c
Cincinnati	3.05c to 3.20c
Cleveland	2.91c
Detroit	3.00c
New York	3.04c
Philadelphia	3.10c
San Francisco	3.40c
Seattle	3.50c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.65c
PLATES	
Boston	3.35c
Boston 3/16-inch	3.04c
Buffalo	3.05c to 3.10c
Chicago	2.90c
Cincinnati	2.95c to 3.20c
Cleveland	2.91c
Detroit	3.00c
New York	3.04c
Philadelphia	3.70c
San Francisco	3.40c
Seattle	3.50c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.85c
NO. 10 BLUE ANNEALED SHEETS	
Boston, ⅛-inch	4.15c
Buffalo	4.05c
Chicago	4.00c
Cincinnati	3.75c to 4.00c
Cleveland	3.50c to 3.76c
Detroit	3.95c
New York	4.19c
Philadelphia	3.85c
San Francisco	4.50c
Seattle	4.85c
St. Louis	4.10c
St. Paul	4.25c
Los Angeles	4.70c
NO. 28 BLACK SHEETS	
Boston	5.40c
Buffalo	4.85c
Chicago	4.85c
Cincinnati	4.00c
Cleveland	4.00c
Detroit	4.90c
New York	4.90c
Philadelphia	4.60c
San Francisco	5.80c
Seattle	5.85c
St. Louis	4.95c
St. Paul	5.10c
Los Angeles	6.10c
NO. 28 GALVANIZED SHEETS	
Boston	6.40c
Buffalo	5.85c
Chicago	5.85c
Cincinnati	5.20c
Cleveland	5.00c
Detroit	5.90c
New York	5.90c
Philadelphia	5.75c
San Francisco	6.65c
Seattle	6.85c
St. Louis	5.95c
Los Angeles	6.90c
BANDS	
Boston	4.25c
Buffalo	3.75c to 3.80c
Chicago	3.55c
Cincinnati	3.70c to 3.85c
Cleveland	3.61c
Detroit	3.70c
New York	3.74c
Philadelphia	3.70c
San Francisco	4.05c
Seattle	4.15c
Los Angeles	4.40c
HOOPS	
Boston	4.75c
Buffalo	3.90c to 4.00c
Cleveland	3.61c
Detroit	3.95c
New York	4.29c
Philadelphia	4.10c
Seattle	4.90c
COLD ROLLED SHAFTING	
Boston (rounds)	4.00c
Buffalo	3.90c to 3.95c
Chicago (rounds)	3.80c
Cincinnati (rounds)	3.75c
Detroit (rounds)	3.80c
New York	3.90c
New York (flats, squares and hexagons)	4.40c
Philadelphia (rounds)	3.60c
San Francisco	5.00c
Seattle	5.25c
Los Angeles	5.10c
Boston (flats, squares and hexagons)	4.15c



LINK-BELT POWER HOE (IMPROVED DRAG SCRAPER)

The Link-Belt Power Hoe is an effective arrangement for storing and reclaiming coal, sand, gravel, or any loose material in either open or covered storage. It is low in both first cost and operating cost.

It involves principles that are new to this class of implement which not only prevent overloading or "digging in" but also eliminate the necessity of dumping at the end of the haul.

The movable anchor and balanced pulley blocks allow the use of one-third the number of anchor posts required by similar devices of this kind.

The Link-Belt Power Hoe is adaptable to storage areas of any shape, where the haul is not more than 400 feet. Send for the Link-Belt Power Hoe Book No. 444

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

New York - - Woolworth Bldg. Wilkes Barre - - 2d Nat'l Bank Bldg. Seattle - - - 820 First Ave., S. Louisville, Ky. - - P. Weble Starks Bldg.
Boston 9 - - - 49 Federal St. Huntington, W. Va - Robeson-Prichard Bldg. Portland, Ore. - - - 101 First Sts. New Orleans C. O. Hine, 504 Carondelet Bldg.
Pittsburgh - - - 1501 Park Bldg. Cleveland - - - 429 Kirby Bldg. San Francisco - - - 168 Second St. Birmingham, Ala. C. L. Morrow, 720 Brown-Marx Bldg.
St. Louis - - Central Nat'l Bank Bldg. Detroit - - - 4219 Woodward Ave. Los Angeles - - 128 N. Los Angeles St.
Buffalo - - - 347 Ellicott Square Kansas City, Mo. - - 306 Elmhurst Bldg. Denver Lindsoeth, Phubert & Co., Boston Bldg.

Canadian Link-Belt Co., Ltd., Toronto and Montreal H. W. CALDWELL & SON CO., CHICAGO NEW YORK, Woolworth Bldg. DALLAS, TEXAS, 700 Main St.

LINK-BELT

(*Continued from Page 744*)

95 feet, for the Hermann Motor Car Co., at 680-684 College avenue.

APPLETON, WIS.—A 1-story garage and repair shop, 48 x 122 feet, will be erected here by W. H. St. John, 205 North Van Buren street, Green Bay, Wis. The architect and general contractor is Earl F. Miller Co., Appleton.

CHIPPEWA FALLS, WIS.—The C. H. Bergman Coal Co., Eau Claire, Wis., will establish a branch plant here and build a $25,000 storage plant with a capacity of 1000 to 1200 tons.

CLINTONVILLE, WIS.—A garage and repair shop, 50 x 120 feet, will be erected by the Service Automobile Co. at a cost of $20,000.

CLINTONVILLE, WIS.—E. H. Ramm, New London, Wis., who maintains a branch of his automobile, implement and hardware business here, will build a $20,000 garage, warehouse and machine service shop, 50 x 120 feet.

HAYWARD, WIS.—Architect E. F. Johnson, Superior, Wis., has been engaged by the local board of education to prepare plans for a $125,000 high school, which will provide for manual training department.

MADISON, WIS.—A boiler room and coal bunker will be erected by the Madison Tool & Stamping Works at its plant, 1917 Helena street.

MADISON, WIS.—This city will expend about $800,000 on the construction and equipment of a municipal sewage disposal plant, specifications for which now are being completed. E. E. Parker is city engineer.

MADISON, WIS.—The Freeman-Riff Co., Terre Haute, Ind., has been awarded contracts to install coal bunkers, chutes, etc., in the power house addition being erected by the Madison Gas & Electric Co.

MERRILL, WIS.—The Truck & Tractor Improvement Co., a $100,000 corporation organized here, will manufacture a gear drive mechanism for motor trucks and tractors, designed and patented by Rosa Koile of this city, who is president of the company.

MILWAUKEE—R. E. Newton, 185 Mason street, has the general contract to build a 1-story garage and repair shop, 50 x 150 feet, for the Magnetic Realty Co.

MILWAUKEE—The plant of the former Petit Mfg. Co., 1505 Buffum street, taken over by the Air Reduction Sales Co., Inc., for its western plant, will be enlarged by the erection of a 1 and 2-story addition, 30 x 80 feet.

MILWAUKEE—August C. Habeck, 1488 Maryland avenue, will build a 2-story woodworking factory, 50 x 100 feet, at 3031 Lisbon avenue. With machinery the plant will cost about $20,000.

MILWAUKEE—The J. J. Jones Co., which recently enlarged its hardware store at 1015-1017 Third street to provide room for manufacture of hardware and sheet metal goods, has increased its capital stock to $210,000, consisting of $150,000 common and $60,000 preferred stock.

MILWAUKEE—The M. Hilty Lumber Co., Telfth street, plans the erection of a factory building and power house. The main building will be 3-stories, 102 x 110 feet while the power hoists will be 40 x 75 feet.

MILWAUKEE—Aticles of incorporation have been filed by the Vorclone Co., of Milwaukee, to manufacture, buy and sell machinery, mechanical devices, equipment, etc. The incorporators are M. J. Power, Thomas J. Power and John T. Blake, attorney, all of Madison, Wis.

OSHKOSH, WIS.—C. R. Meyer & Sons Co. has the general contract to build a machine shop addition, 60 x 120 feet, to the Hathaway-Buick Co.'s garage at 25 Church street.

PESHTIGO, WIS.—A 3-story factory addition, 60 x 100 feet, will be erected by Thompson Bros., manufacturers of power boats and other water craft.

PLYMOUTH, WIS.—A factory costing $35,000 will be erected by the Badger Cabinet Co. to replace the plant damaged by fire early this year.

RACINE, WIS.—The Philip Meyer Mfg. Co. has been organized with $25,000 capital stock to manufacture meat and food choppers, etc., by Philip, Ruth and John Meyer.

RACINE, WIS.—A $500,000 corporation is being formed by George H. Wheary and Harry L. Burg, to manufacture trunks, etc. Part of the former plant of the Racine-Sattley Carriage Works will be occupied by the company.

SHAWANO, WIS.—A $20,000 central heating plant will be erected for the courthouse, county jail and adjoining county buildings. Architect W. E. Reynolds, Green Bay, Wis., is in charge.

SHEBOYGAN, WIS.—Contracts have been let by the Sheboygan Foundry Co., gray iron castings, for a pattern shop, storage vault, grinding and cleaning room and office building. The improvements will cost about $20,000.

SHEBOYGAN, WIS.—A charter has been granted to the Modern Auto Parts Co. to manufacture and deal in automobile, truck and tractor specialties, parts and accessories. The capital stock is $20,000 and the incorporators are H. J. Sieners, R. P. Loope and J. J. McNulty.

TWO RIVERS, WIS.—McMullen & Pitz, consulting and contracting engineers, have been awarded the contract to reconstruct the approaches to the Seventeenth street drawbridge at a price of $15,654.

Business in Canada

WINNIPEG, MAN.—The Wat Electrical Mfg. Co., Ltd., has been incorporated with $500,000 capital stock by Wilford L. Kane, Percy O. Lathanque and Charles W. Chappell.

WINNIPEG, MAN.—The Dominion Bronze & Iron, Ltd., has been incorporated with $100,000 capital stock by Edward F. Hurd, James J. Mirkin and Walter Tetzlaff.

GEORGETOWN, ONT.—Creelmans, Ltd., has been incorporated to manufacture knitting mill machinery with $200,000 capital stock by Richard L. Creelman, C. E. Creelman and William B. Dilly.

HAMILTON, ONT.—The Beacon Electric Mfg. Co. has been incorporated with $40,000 capital stock by F. L. Freleawen, K. N. Freleawen and M. R. Blaine.

HAMILTON, ONT.—Diamond Devices Ltd., has been incorporated to manufacture locks, etc., with $50,000 capital stock by E. G. Binkley, Howard Morwick and M. R. Blaine.

TORONTO, ONT.—The Keith Electric Refrigerator Co., Ltd., has been incorporated with $100,000 capital stock by David F. Keith, William H. Garvey and John A. Rowland.

TORONTO, ONT.—Parsons Automatic Window Appliance Co., Ltd., has been incorporated to manufacture window appliances, etc., with $360,000 capital stock by William A. J. Case, Norman E. Strickland and George E. Atwood.

WINDSOR, ONT.—The plant of the Maloney Electrical Co. recently was damaged by fire.

New Trade Publications

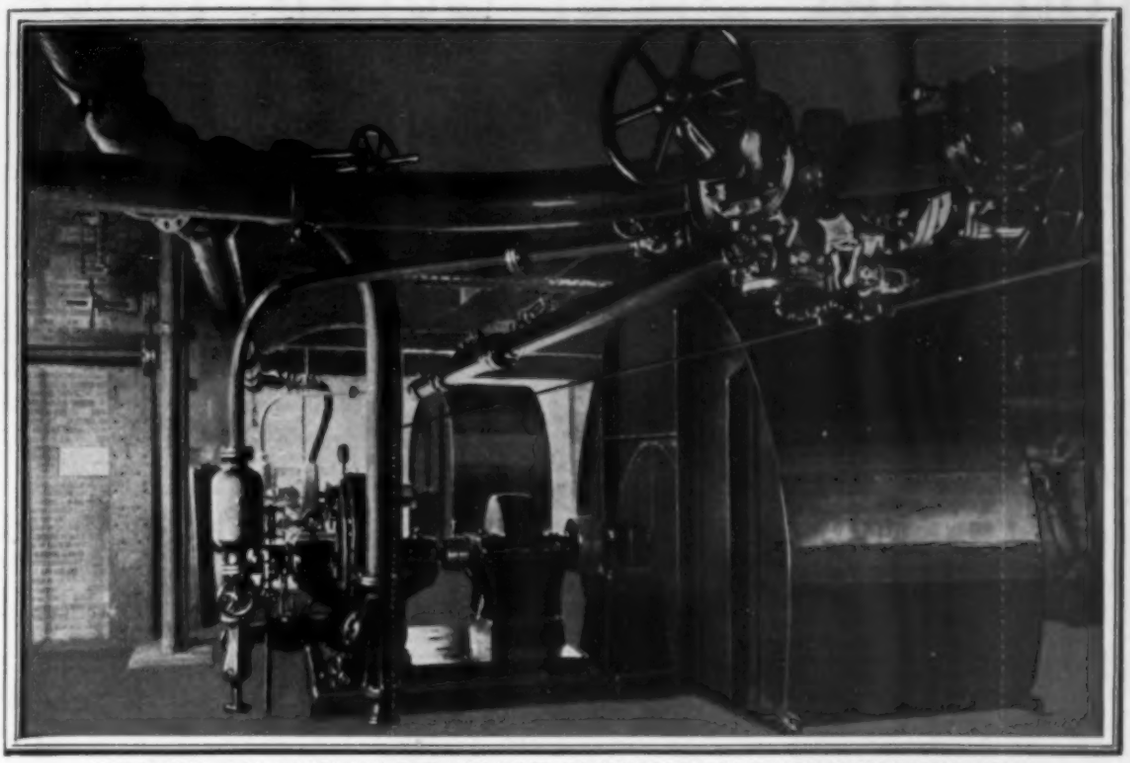
ELECTRIC FURNACES—A 6-page illustrated folder is being circulated by the Electric Furnace Co., Salem, O., in which electric furnaces for melting nonferrous metals are described and illustrated. The folder tells what alloys the furnaces are melting, what products they are producing and what users thing of them. In addition to this folder the company also is circulating another folder which contains a number of illustrations showing some of the many types of electric annealing and heat treating furnaces installed by the company during the past few years. These installations include ones at the plants of the Ingram Richardson Mfg. Co., the American Manganese Steel Co., Lamson & Sessions Co., Mullins Body Corp., National Malleable Casting Co., and C. H. Wills & Co.

RELAYS—Operation and general application of relays is minutely described in a 28-page bulletin recently published by the General Electric Co., Schenectady, N. Y.—The data given is supplemented by numerous diagrams and line drawings.

STEAM SPECIALTIES—The Reliance Gauge Co., Cleveland, is circulating a 16-page illustrated booklet in which steam specialties are described and illustrated. These include safety water columns, electric alarms for water columns, seamless copper floats, water gages, gage cocks and steam traps. In addition some general information is given.

PNEUMATIC COLLECTING—The B. F. Sturdevant Co., Hyde Park, Boston, has issued a 72-page bulletin on pneumatic collecting and conveying. It contains 33 pages of illustrations and diagrams, 17 pages of useful tables, such as how to find the size of fans, the suction, volume, rpm., and horsepower of any system, cubic feet of air handled per minute, size of pipe and ducts used, and many others. Data also is given on dust collecting from grinding and polishing machines, tumbling barrels, sandblast machines, coal breakers, shoe machinery and the removal of fumes, gases, etc. In addition parts of the booklet are devoted to the conveying of pulverized coal, fibrous materials, coffee, ashes, wool, wood chips, ect.

DUST COLLECTING—A 16-page illustrated booklet has been published by the W. W. Sly Mfg. Co., Cleveland, in which the use of dust collecting equipment is described and illustrated. According to the booklet losses caused by dust includes wasting valuable products, damaging machinery, causing accidents, disfiguring buildings, impairing health, decreasing plant efficiency, increasing maintenance costs and causing explosions. Each of these losses are described. The company's dust arresting equipment is described in detail, the descriptions being supplemented with half-tone illustrations and line drawings.



FAN ROOM, KELLY-SPRINGFIELD TIRE PLANT, CUMBERLAND, MARYLAND, CRANE EQUIPPED

CRANE OIL AND STEAM SEPARATORS

Crane oil and steam separators mechanically eliminate oil and water from exhaust steam—thus conserving the strength and serviceability of the boiler.

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GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO

Branches and Sales Offices in One Hundred and Thirty-five Cities

National Exhibit Rooms: Chicago, New York, Atlantic City

Works: Chicago and Bridgeport

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$13.00 to 15.00
Boston (dealers)	11.00 to 12.50
Buffalo	17.00
Chicago	18.50 to 19.00
Cincinnati	16.50 to 17.00
Cleveland	17.75 to 18.25
Detroit (dealers)	12.75 to 13.25
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	11.50 to 12.00
Pittsburgh	19.50 to 20.00
San Francisco	11.50
St. Louis	18.00 to 18.50
Valleys	19.50 to 20.50
No. 1 railroad steel New York (dealers)	12.75 to 13.25

BUNDLED SHEETS

Buffalo	$11.00 to 11.50
Cleveland (hydraulic)	15.75 to 16.00
Cincinnati	12.50 to 13.00
Eastern Pennsylvania	14.50 to 15.50
Pittsburgh	16.00 to 16.50
St. Louis	8.50 to 9.00
Valleys (hydraulic)	17.25 to 17.50

STEEL RAILS, SHORT

Birmingham	$15.50 to 16.50
Boston (dealers)	10.00 to 11.00
Chicago	21.00 to 21.50
Cincinnati	15.00 to 15.50
Cleveland	16.25 to 17.00
St. Louis	19.00 to 19.50

STOVE PLATE

Birmingham	$15.50 to 16.50
Boston (consumers)	13.50 to 14.00
Buffalo	15.00 to 15.50
Chicago	19.75 to 20.25
Cincinnati (net)	14.00 to 15.00
Cleveland	16.25 to 16.75
Detroit	11.50 to 12.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.00 to 12.50
Pittsburgh	16.00 to 16.50
St. Louis	18.00 to 18.50

LOW PHOSPHORUS

Buffalo	$19.00 to 20.00
Cincinnati	18.00 to 18.50
Eastern Pennsylvania	22.00 to 23.00
Pitts. billet and bloom crops	23.00 to 24.00

SHOVELING STEEL

Chicago	$18.00 to 18.50
Pittsburgh	16.00 to 16.50
St. Louis	19.50 to 20.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	$22.50 to 23.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	21.00 to 21.50
St. Louis	20.50 to 21.00

COMPRESSED SHEETS

Buffalo	$14.25 to 14.75
Chicago	14.25 to 14.75
Pittsburgh	17.00 to 17.50

FROGS, SWITCHES, GUARDS

Chicago	$18.50 to 19.00
Eastern Pennsylvania	16.50 to 17.00
St. Louis	17.50 to 18.00

BOILER PLATE, CUT

Detroit (dealers)	$8.00
St. Louis (dealers)	13.00 to 13.50

ANGLE BARS—STEEL

Chicago	$20.50 to 21.00
St. Louis	17.00 to 17.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$15.00 to 16.00
Boston (dealers)	11.00 to 12.00
Buffalo	15.00 to 16.00
Chicago, No. 1	20.25 to 20.75
Chicago, No. 2	19.00 to 19.50
Cincinnati, No. 1	14.00 to 15.00
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	21.50 to 21.50
Pittsburgh, No. 1	16.00 to 16.50
Pittsburgh, No. 2	19.50 to 20.00
New York, No. 1 (dealers)	15.50 to 16.00
St. Louis, No. 1	18.50 to 19.00
St. Louis No. 2	17.50 to 18.00

WROUGHT PIPE

Boston (dealers)	$8.75 to 9.25
Buffalo	12.00 to 12.50
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	10.75 to 11.25

YARD WROUGHT

Boston	$11.00 to 13.00
Eastern Pennsylvania, No. 1	18.00 to 19.00

CITY WROUGHT

New York, long	$13.00 to 13.50

BUSHELING

Buffalo, No. 1	15.00 to 15.50
Chicago, No. 1	17.00 to 17.50
Chicago, No. 2	10.00 to 10.50
Cincinnati, No. 1	13.50 to 14.50
Cleveland, No. 1	13.75 to 14.00
Cleveland, No. 2	12.50 to 13.00
Eastern Pennsylvania, No. 1	14.50 to 15.00
Pittsburgh, No. 1	16.00 to 16.50
St. Louis, No. 1	16.00 to 16.50
Detroit, No. 1	10.50 to 11.00

MACHINE SHOP TURNINGS

Birmingham	$7.00 to 8.00
Boston (dealers)	8.75 to 9.00
Buffalo	11.00 to 12.00
Chicago	13.00 to 13.50
Cincinnati (net)	11.00 to 12.00
Cleveland	13.25 to 13.75
Detroit (dealers)	8.75 to 9.25
Eastern Pennsylvania	14.50 to 15.50
New York (dealers)	10.75 to 11.50
Pittsburgh	15.00 to 15.50
St. Louis	11.00 to 11.50
Valleys	13.50 to 14.00

CAST IRON BORINGS

Birmingham (chemical)	$15.00 to 16.00
Birmingham, borings (plain)	10.00 to 11.00
Boston (chemical)	13.00 to 13.50
Boston (dealers)	7.50 to 8.00
Buffalo	13.50 to 14.00
Chicago	14.50 to 15.00
Cincinnati (net)	12.00 to 13.00
Cleveland	14.00 to 14.25
Detroit (dealers)	10.75 to 11.25
Eastern Pennsylvania	15.00 to 16.00
Eastern Pennsylvania (chemical)	17.00 to 18.00
Pittsburgh	17.00 to 18.00
New York (dealers' price)	10.75 to 11.50
St. Louis	13.00 to 13.50
Valleys	15.25 to 15.50

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	$8.00 to 8.50
Cleveland	13.75 to 14.00
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	10.75 to 11.50

IRON AXLES

Birmingham	$15.50 to 16.50
Boston	20.00 to 21.00
Buffalo	23.00
Chicago	28.50 to 29.00
Cincinnati	21.00 to 22.50
Detroit	20.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	23.00 to 24.00
Pittsburgh	27.00 to 28.00
St. Louis	29.50 to 30.00

IRON RAILS

Buffalo	$16.00 to 17.00
Chicago	22.50 to 23.00
Cincinnati	14.50 to 15.00
Cleveland	16.50 to 17.00
St. Louis	18.00 to 18.50

PIPES AND FLUES

Chicago	$14.50 to 15.00
Cincinnati	10.00 to 11.00
Cleveland	12.50 to 13.00
St. Louis	11.50 to 12.00

RAILROAD GRATE BARS

Buffalo	$14.00 to 14.50
Chicago	19.50 to 20.00
Cleveland	16.00 to 16.50
Eastern Pennsylvania	16.00 to 17.00
New York (dealers)	12.00 to 12.50
St. Louis	18.50 to 19.00

FORGE FLASHINGS

Boston (dealers)	$7.50 to 7.75
Chicago, small	12.50 to 13.00
Cleveland, small	13.50 to 14.00
Cleveland, large	13.00 to 13.50
Detroit (dealers)	9.50 to 10.00

FORGE SCRAP

Boston	$8.00 to 8.50
Chicago	19.00 to 19.50
Eastern Pennsylvania, No. 1	14.50 to 15.50

ARCH BARS AND TRANSOMS

Chicago	$25.00 to 25.50
St. Louis	24.00 to 24.50

ANGLE BARS—IRON

Chicago	$24.00 to 24.50
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$9.00 to 9.50
Buffalo	15.00 to 15.50
Chicago	15.50 to 16.00
Cleveland	14.75 to 15.25
Detroit	11.50 to 12.00
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	16.50 to 17.00
St. Louis	13.00 to 13.50

STEEL CAR AXLES

Birmingham	$15.50 to 16.50
Boston (dealers)	15.00 to 18.00
Buffalo	21.00 to 22.00
Chicago	21.75 to 22.25
Cleveland	24.00 to 25.00
Eastern Pennsylvania	25.00 to 26.00
New York (dealers)	17.00 to 18.00
Pittsburgh	21.00 to 22.00
St. Louis	22.50 to 23.00

SHAFTING

Boston (dealers)	$15.00 to 18.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	22.50 to 23.50
New York (dealers)	16.00 to 16.50
St. Louis	18.50 to 19.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$14.50 to 15.50
Birmingham, tram car	16.50 to 17.00
Boston (consumers)	18.50 to 19.00
Buffalo, iron	19.00 to 19.50
Chicago, iron	23.50 to 24.00
Cincinnati	16.00 to 17.00
Cleveland, iron	13.00 to 13.50
Detroit	14.50
Eastern Pennsylvania, iron	20.50 to 21.50
New York, iron (dealers)	15.00 to 16.00
Pittsburgh, iron	22.00 to 22.50
Pittsburgh, steel	21.00 to 22.00
St. Louis, iron	23.00 to 24.00

NO. 1 CAST SCRAP

Birmingham, cupola	$15.50 to 16.50
Boston (consumers)	19.00 to 20.00
Buffalo	19.50 to 20.00
Chicago, cupola	24.25 to 24.75
Cincinnati, No. 1, machinery, cupola (net)	18.00 to 19.00
Cleveland, cupola	20.00 to 21.00
Eastern Pennsylvania, cupola	20.50 to 21.50
New York, cupola dealers)	17.50 to 18.00
Pittsburgh, cupola	21.50 to 22.00
San Francisco	26.00
St. Louis, agricultural	23.00 to 23.50
St. Louis, railroad	23.00 to 23.50
Valleys	20.50 to 21.00
Detroit, machinery (net)	15.50 to 16.00

HEAVY CAST

Boston (consumers)	$17.50 to 18.50
Buffalo	16.00 to 16.50
Cleveland	16.00 to 16.25
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	16.50 to 17.00
Pittsburgh	20.00 to 21.00
Detroit, automobile (net)	19.00 to 19.50

MALLEABLE

Boston (railroad)	$15.50 to 16.00
Buffalo	19.00 to 19.50
Chicago, railroad	23.50 to 24.00
Chicago, agricultural	23.50 to 24.00
Cincinnati, agricultural	16.00 to 17.00
Cincinnati, railroad	15.50 to 17.00
Cleveland, agricultural	17.00 to 17.25
Cleveland, railroad	18.25 to 18.75
Detroit	14.00
Eastern Pennsylvania, railroad	21.00 to 22.00
Pittsburgh, railroad	18.00 to 18.50
Pittsburgh, agricultural	16.00 to 16.50
St. Louis, agricultural	18.00 to 18.50
St. Louis, railroad	18.50 to 19.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

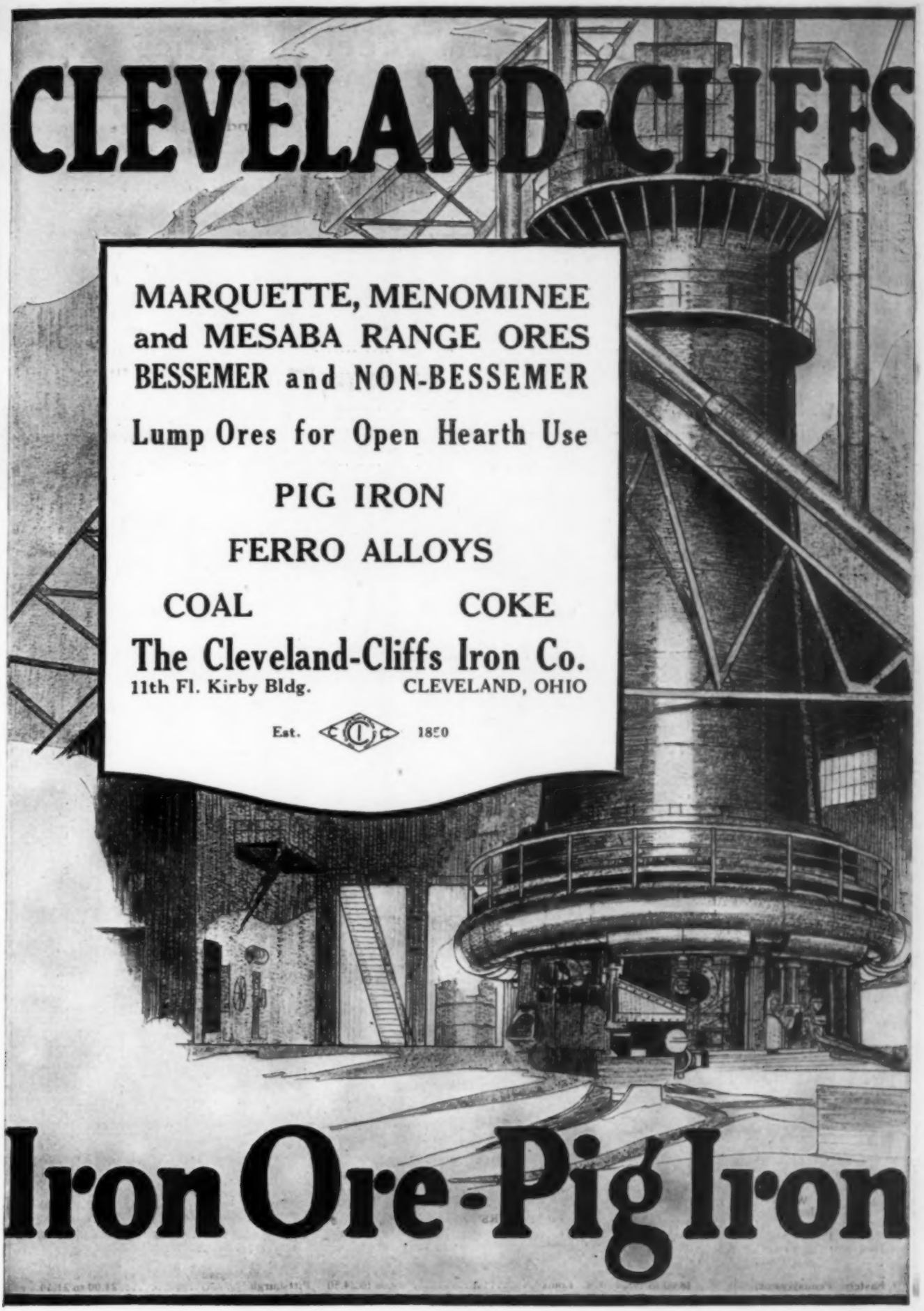
Birmingham	$16.00 to 17.00
Boston (dealers)	12.00 to 12.50
Chicago	19.50 to 20.00
Cleveland	18.75 to 19.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	13.50 to 14.50
Pittsburgh district	19.50 to 20.00
St. Louis	18.50 to 19.00

LOCOMOTIVE TIRES

Chicago	$17.50 to 18.00
St. Louis	15.00 to 15.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$19.50 to 20.00
Eastern Pennsylvania	18.00 to 20.00
Pittsburgh	21.00 to 21.50


CLEVELAND-CLIFFS
MARQUETTE, MENOMINEE
and MESABA RANGE ORES
BESSEMER and NON-BESSEMER
Lump Ores for Open Hearth Use
PIG IRON
FERRO ALLOYS
COAL
COKE
The Cleveland-Cliffs Iron Co.
11th Fl. Kirby Bldg.
CLEVELAND, OHIO
Est.
1850
Iron Ore-Pig Iron

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	729,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	203,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	667,300	281,700	92,700	58,000
Monthly average 1921..	217,600	280,300	71,800	79,600
1921				
January	642,100	288,000	110,600	93,500
February	463,600	287,400	103,700	81,700
March	386,000	295,300	104,700	27,600
April	60,300	287,700	94,700	70,800
May	13,600	278,100	74,600	78,700
June	800	289,900	67,400	81,700
July	10,200	202,400	44,600	70,000
August	94,200	250,800	43,800	72,800
September	158,300	239,800	79,800	86,200
October	235,500	251,800	45,800	98,800
November	271,800	290,000	59,800	92,400
December	275,000	296,300	73,000	100,800
Total for 1921	2,611,400	3,308,500	862,500	955,000
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	.....	125,200	.....

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	754,700	250,200	101,300	49,000
Monthly average 1921..	302,100	254,500	65,000	62,300
1921				
January	493,400	263,700	119,100	70,800
February	483,500	259,600	98,400	62,000
March	359,100	246,900	96,300	19,700
April	70,600	252,600	108,700	57,100
May	5,700	240,400	62,800	56,100
June	2,700	240,800	54,200	61,000
July	117,200	219,500	26,900	57,100
August	434,100	228,600	27,800	55,100
September	429,300	232,100	34,000	76,200
October	405,400	255,900	41,900	81,800
November	443,800	272,700	46,200	69,900
December	381,000	297,600	63,200	80,700
Total for 1921	3,625,800	3,010,400	779,500	747,500
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	.....	112,500	.....

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
Average monthly 1921..	137,100	38,500	43,300	.....
1921				
January	157,800	44,200		
February	153,400	35,400	120,100	125,000*
March	156,100	33,900		
April	102,100	26,100		
May	81,900	31,700	95,500	36,000
June	84,500	20,700		42,100
July	103,600	30,300		45,100
August	141,500	16,100	130,600	61,200
September	206,100	27,900		79,800
October	172,800	19,800		96,600
November	169,200	20,700	168,000	54,300
December	117,000	128,000		56,300
Total for 1921	1,646,000	434,800	514,200	596,400*
1922				
January	88,700	36,600	139,000	68,200
February	64,600	55,800	First	66,900
March	63,800	67,300	Quarter	105,700
April	59,900	89,100	.....	129,000
May	60,900	41,100	.....	154,300
June	52,800	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	516,900
Average monthly 1919..	186,100	19,400	14,500	.....
Average monthly 1920..	271,100	74,600	74,300	143,600
1921				
January	232,400	89,300		
February	166,900	125,800	294,000	503,600*
March	148,900	122,700		
April	160,100	117,400		.....
May	99,000	96,900	241,300	127,800
June	64,700	109,100		159,700
July	64,000	87,600		175,000
August	76,500	122,500	192,300	236,300
September	133,300	171,200		221,800
October	155,800	188,300		242,300
November	193,500	167,400	176,000	230,600
December	205,300	131,700		212,900
Total for 1921	1,700,400	1,529,900	.....	2,110,000*
1922				
January	253,300	164,000	198,400	218,200
February	223,400	107,000	First	170,000
March	295,800	72,300	Quarter	208,700
April	258,400	125,800	.....	195,500
May	272,400	122,200	.....	204,500
June	236,300	.....	.....	.....

*Provisional estimate. Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1922		
July	44,384	156,392
June	24,101	216,298
May	17,292	229,616
April	15,884	197,562
March	8,612	206,474
February	10,216	133,333
January	10,511	155,822
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	316,447
Total	117,103	2,156,818
1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
	Imports	Exports
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
December	39,806	254,780
November	42,826	336,994
October	40,698	302,459
September	43,567	363,531
August	28,987	396,743
July	28,258	287,685
June	21,056	561,020
May	17,885	422,282
April	16,560	396,813
March	17,632	367,224
February	12,302	344,180
January	16,913	371,579
Total	327,490	4,405,281
1918		
December	28,996	356,641
November	11,582	471,427
October	15,744	426,767
September	8,440	473,688
August	12,520	512,104
July	11,511	452,759
June	13,913	418,605
May	14,387	488,515
April	11,371	462,887
March	14,345	379,924
February	12,941	438,848
January	12,475	490,259
Total	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687